6.0 THREATENED AND ENDANGERED SPECIES

6.1 INTRODUCTION

Section 7(a)(2) of the ESA of 1973 requires federal agencies, in consultation with the agencies responsible for administering the ESA, the NMFS and the USFWS, to ensure that any action they authorize is not likely to jeopardize the continued existence and recovery of any species listed as threatened or endangered or result in the destruction or adverse modification of critical habitat. An endangered species is defined as a species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range (Tetra Tech 2005a).

The threatened and endangered species listed below may be present near the proposed project.

- Chinook salmon (*Oncorhynchus tshawytscha*)
- Sockeye salmon (*Onchorhynchus nerka*)
- Short-tailed albatross (*Phoebastrai albatrus*)
- Steller’s eider (*Polysticta stelleri*)
- Blue whale (*Baleaptera musculus*)
- Fin whale (*Balaenoptera physalus*)
- Humpback whale (*Megaptera novaengliae*)
- Northern Pacific right whale (*Eubalaena japonica*)
- Sei whale (*Balaenoptera borealis*)
- Sperm whale (*Physeter macrocephalus*)
- Steller sea lion (*Eumetopias jabatus*)
- Northern sea otter (*Enhydra lutris kenyoni*)

The Cook Inlet stock of beluga whales (*Delphinapterus leucas*) has been designated as depleted under the Marine Mammal Protection Act (MMPA) and area federal species of concern; therefore, beluga whales are also addressed in this section (NMFS 2000c).

A draft Biological Evaluation (BE) was prepared to assess the discharges from oil and gas exploration, development, and production facilities covered under the proposed NPDES general permit for Cook Inlet (Tetra Tech 2005a). The BE provides details about the geographic range and distribution, critical habitat, life history, and population trends and risks for each of the threatened and endangered species identified in this section of the ODCE (Tetra Tech 2005a).

6.2 ABUNDANCE AND DISTRIBUTION OF THREATENED AND ENDANGERED SPECIES

6.2.1 Fish

6.2.1.1 Snake River Fall Chinook Salmon

Chinook salmon are anadromous and semelparous meaning that as adults, they migrate from a marine environment into the fresh water streams and rivers of their birth (anadromous) where they spawn and die (semelparous). Seasonal *runs* (i.e., spring, summer, fall, or winter) have been identified on the basis of when adult chinook salmon enter fresh water to begin their spawning migration (Tetra Tech 2005a). Because genetic analyses indicate that fall-run chinook salmon in the Snake River are a distinct evolutionarily significant unit (ESU) from the spring/summer-run in the Snake River Basin (Waples et al. 1991), Snake River fall-run chinook salmon are considered separately. NMFS clarified the status of both ESUs as threatened in 1992 (NMFS 1992).

Two distinct races have evolved among chinook salmon. The *stream-type* race of chinook salmon, is found most commonly in headwater streams. Steam-type chinook salmon have a longer fresh water residency, and demonstrate extensive offshore migrations into the North Pacific before returning to their natal streams in the spring or summer months (NMFS 1998; Healy 1991). The *ocean-type* chinook, including the Snake River fall-run chinook salmon ESU are commonly found in coastal streams in North America. Ocean-type chinook migrate to sea where they tend to spend their ocean life in coastal waters within about 1,000 kilometers (621 miles) from their natal river (NMFS 1998; Healy 1991). Ocean-type chinook salmon return to their natal streams or rivers in spring, winter, fall, summer, and late-fall runs, but summer and fall runs predominate (Tetra Tech 2005a). The difference between these life history types is also physical, with both genetic and morphological foundations (NMFS 1998).

Almost all historical Snake River fall-run chinook salmon spawning habitat in the Snake River Basin has been blocked by the Hells Canyon Dam complex; other habitat blockages have also occurred in Columbia River tributaries. The ESU's range has also been affected by agricultural water withdrawals, grazing, and vegetation management within the Columbia and Snake River Basins. The continued straying by nonnative hatchery fish into natural production areas is an additional source of risk (Tetra Tech 2005a).

The historical population of Snake River fall-run chinook salmon is difficult to estimate. Irving and Bjornn (1981) estimated a population of 72,000 for the period of 1938 to 1949 that declined to 29,000 during the 1950s (Tetra Tech 2005a). Numbers declined further following completion of the Hells Canyon Dam complex. The Snake River component of the fall-run chinook has been increasing during the past few years as a result of hatchery and supplementation efforts in the Snake and Clearwater River Basins. In 2002, more than 15,200 fall-run chinook were counted past the two lower dams on the Snake River, with about 12,400 counted above Lower Granite Dam. These adult returns are about triple the 10-year average at these Snake River projects (FPC 2003). For the Snake River fall-run chinook salmon ESU, NOAA Fisheries estimates that the median population growth rate (lambda) over a base period from 1980 through 1998 ranges from 0.94 to 0.86. The decrease in growth rate reflects the increased effectiveness of hatchery fish spawning in the wild increases compared with that of fish of wild origin (McClure et al. 2000).

The critical habitat for the Snake River fall chinook salmon was listed on December 28, 1993 (NMFS 1993a) and modified on March 9, 1998, (NMFS 1998) to include the Deschutes River in Oregon. The designated critical habitat does not include any waters within the state of Alaska. It does include all river reaches accessible to chinook salmon in the Columbia River from The Dalles Dam upstream to the confluence with the Snake River in Washington (inclusive). Critical habitat in the Snake River includes its tributaries in Idaho, Oregon, and Washington (exclusive of the upper Grande Ronde River and the Wallowa River in Oregon, the Clearwater River above its confluence with Lolo Creek in Idaho, and the Salmon River upstream of its confluence with French Creek in Idaho). Also included are river reaches and estuarine areas in the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to The Dalles Dam (Tetra Tech 2005a). Areas above specific dams or above longstanding, naturally impassable barriers (e.g., natural waterfalls in existence for at least several hundred years) are excluded (NMFS 1998).

6.2.1.2 Snake River Spring/Summer Chinook Salmon

Recent trends in redd counts in major tributaries of the Snake River indicate that many subpopulations could be at critically low levels. Subpopulations in the Grande Ronde River, Middle Fork Salmon River, and Upper Salmon River Basins are at especially high risk. Both demographic and genetic risks would be of concern for such subpopulations, and in some cases, habitat may be so sparsely populated that adults have difficulty finding mates. NOAA Fisheries estimates that the median population growth rate (lambda) over a base period from 1980 through 1998 ranges from 0.96 to 0.80, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared with the effectiveness of fish of wild origin (McClure et al. 2000). In 2002, the fish count at Lower Granite Dam was 75,025, more than double the 10-year average. Estimated hatchery chinook at Lower Granite Dam accounted for a minimum of 69.7 percent of the run (Tetra Tech 2005a). The spring chinook count in the Snake River was at the all-time low of about 1,500 as recently as 1995, but in 2001 and 2002, both hatchery and wild/natural returns to the Snake River increased (FPC 2003).

The critical habitat for the Snake River spring/summer chinook salmon was listed in 1993 (NMFS 1993a). The designated habitat consists of river reaches of the Columbia, Snake, and Salmon Rivers, and all tributaries of the Snake and Salmon Rivers (except the Clearwater River) presently or historically accessible to Snake River spring/summer chinook salmon (except reaches above impassable natural falls and Hells Canyon Dam) (Tetra Tech 2005a).

6.2.1.3 Sockeye Salmon

Snake River sockeye salmon returns to Redfish Lake since at least 1985, when the Idaho Department of Fish and Game began operating a temporary weir below the lake, have been extremely small (1 to 29 adults counted per year). Snake River sockeye salmon have a very limited distribution relative to critical spawning and rearing habitat. Redfish Lake represents only one of the five Stanley Basin lakes historically occupied by Snake River sockeye salmon. NMFS proposed an interim recovery level of 2,000 adult Snake River sockeye salmon in Redfish Lake and two other lakes in the Snake River Basin (NMFS 1995). Because only 16 wild and 264 hatchery-produced adult sockeye returned to the Stanley River Basin between 1990 and 2000, NMFS considers the risk of extinction of this ESU to be very high (Tetra Tech 2005a). In 2002, 52 adult sockeye were counted at Lower Granite Dam (FPC 2003). As of September 23, 2003, 12 sockeye salmon have been counted at Lower Granite Dam on the Snake River (USACE 2003).

Historically, the largest numbers of Snake River sockeye salmon returned to headwaters of the Payette River, where 75,000 were taken one year by a single fishing operation in Big Payette Lake. During the early 1880s, returns of Snake River sockeye salmon to the headwaters of the Grande Ronde river in Oregon (Walleye Lake) were estimated between 24,000 and 30,000 at a minimum (Cramer 1990). During the 1950s and 1960s, adult returns to Redfish Lake numbered more than 4,000 fish (Tetra Tech 2005a).

The critical habitat for the Snake River sockeye salmon was designated on December 28, 1993 (NMFS 1993a). The designated habitat consists of river reaches of the Columbia, Snake, and Salmon Rivers, Alturas Lake Creek, Valley Creek, and Stanley, Redfish, Yellow Belly, Pettit, and Alturas Lakes (including their inlet and outlet creeks) (Tetra Tech 2005a).

6.2.2 Birds

6.2.2.1 Short-tailed Albatross (Phoebastrai albatross)

The short-tailed albatross was listed as endangered under the ESA in waters of the United States on July 30, 2000. This species once ranged throughout most of the North Pacific Ocean and Bering Sea with known nesting colonies on several islands within the territorial waters of Japan and Taiwan (Tetra Tech 2005a). Other undocumented nesting colonies may also have existed in areas under U.S. jurisdiction on Midway Atoll in the Aleutian Islands; however, the evidence for breeding on the Alaskan Aleutian Islands is based on scant evidence considered highly unlikely (USFWS 2000a).

Breeding colonies of the short-tailed albatross are currently known on two islands in the western North Pacific and East China Sea. The marine range within U.S. territorial waters includes Alaska's coastal shelf break areas and the marine waters of Hawaii for foraging. The extent to which the birds use open ocean areas of the Gulf of Alaska, North Pacific Ocean, and Bering Sea is unknown (USFWS 2000a). Observations by the USFWS (Terry Antrobus, Anchorage, personal communication cited in USFWS 2000a) suggest that short-tailed albatross frequent nearshore and coastal waters, with "many" birds being sighted within 10 kilometers (6 miles) of shore, and fewer birds ("several") observed within 5 kilometers (3 miles) of shore. However, sighting data do not indicate that either the Cook Inlet or Shelikof Strait are part of the typical range of this species (MMS 2003).

Currently, breeding colonies are limited to two Japanese Islands of Torishima and Minami-kojima (USFWS 2000a). Birds arrive at the Torishima breeding colony in October and initiate breeding and egg-laying, which continue through late November. The chicks hatch in late December and January and are close to being full grown by late May or early June at which time the adults begin to abandon the breeding colony and return to sea. The chicks fledge after the departure of the breeding adults and depart the colony by mid-July. Non-breeders and failed breeders disperse from the breeding colony in late winter through spring (USFWS 2000a). The specific geographical and seasonal distribution patterns of the birds, once they depart from the breeding colony, are not well understood (Tetra Tech 2005a). The birds are reported to be long-lived and slow to mature, with an average age at first breeding of 6 years old (USFWS 2000a).

The total population of short-tailed albatross was estimated to be 1,200 birds in 2000 (USFWS 2000a). Demographic information provided by USFWS (2000a) indicates that the breeding population on the island of Torishima is growing at a "fairly rapid rate," with an annual population growth rate of 7.8 percent. No information is available for the other breeding colony located on the island of Minamikojima (Tetra Tech 2005a).

No critical habitat has been designated for short-tailed albatross (Tetra Tech 2005a). The USFWS has determined that the designation of critical habitat for this species is not prudent because it would "not be beneficial to the species" (65 FR 46643, July 31, 2000). USFWS concluded that the designation of critical habitat for potential and actual breeding areas within the U.S. areas of jurisdiction on the Midway Atoll National Wildlife Refuge would not provide additional benefit or protection over that conferred through the jeopardy standard of section 7 of the ESA. With regard to the designation of critical habitat for foraging in the waters of the United States, USFWS concluded there is no information available to support a conclusion that any specific marine habitat areas are uniquely important (USFWS 2000a).

6.2.2.2 Steller's Eider (Polysticta stelleri)

The Alaskan breeding populations of Steller's eider were listed as threatened under the ESA on June 11, 1997 (Tetra Tech 2005a). Two breeding populations in Arctic Russia are not part of the ESA listing in the United States and are not addressed in this section. The historical breeding range of the Alaskan breeding population of Steller's eider is unclear; it may have extended discontinuously from the eastern Aleutian Islands to the western and northern Alaska coasts, possibly as far east as the Canadian border (USFWS 2001). In western Alaska, historical (pre-1970) data suggests that the birds formerly nested on the Yukon-Kuskokwim River Delta (Y-K Delta) and at least occasionally at other western Alaska sites, including the Seward Peninsula, St. Lawrence Island, and possibly the eastern Aleutian Islands and Alaska Peninsula (USFWS 2002).

In recent times, breeding has occurred in two general areas outside of the NPDES general permit area. These areas are the Arctic Coastal Plain on the Alaskan North Slope and on the Y-K Delta in western Alaska (USFWS 2001). The Arctic Coastal Plain area, particularly the area surrounding Barrow, is extremely important to nesting Steller's eiders (USFWS 2002). Aerial surveys conducted 1999–2002 in a 2,757 km^2 area from Barrow south to Meade River recorded between 2 to over 100 breeding pairs for a maximum density of 0.08 birds per square kilometer (Tetra Tech 2005a). The Y-K Delta is currently of much lesser importance; only seven nests were found on the Y-K Delta from 1994 to 2002 (USFWS 2002).

After breeding, Steller's eiders move to marine waters where they molt, and individuals remain flightless for about 3 weeks. The birds, which presumably consist of members of both Alaskan and Russian populations, primarily molt outside of the NPDES general permit area along the north side of the Alaska Peninsula, in Izembek Lagoon, Nelson Lagoon, Port Heiden, and Seal Islands (USFWS 2002). After molting, many Steller's eiders disperse to the Aleutian Islands, the south side of the Alaska Peninsula, Kodiak Island, and as far east as Cook Inlet (Tetra Tech 2005a). Wintering birds usually occur in waters less than 10 meters (30 feet) deep and are, therefore, usually found within 400 meters (400 yards) of shore except where shallows extend further offshore in bays and lagoons (USFWS 2002).

The winter range from the Kodiak Island east to lower Cook Inlet overlaps the geographical area of the NPDES general permit. Birds from Alaska and Russian breeding populations intermix on the wintering grounds. It is not known what percentage of the wintering birds that overwinter in areas within or near the NPDES permit area are members of the ESA-listed population (Alaskan breeding population) versus the non-ESA-listed Russian breeding population (Tetra Tech 2005a). According to the USFWS, about 4.2 percent of the Steller's eider in or near the Cook Inlet area are assumed to be from the Alaskan breeding population (MMS 2003).

Determining the population trends for Steller's eider is difficult (USFWS 2000c). Counts conducted in 1992 indicated that at least 138,000 birds wintered in southwest Alaska; although the proportion belonging to the Alaska-breeding population versus those from Russian-breeding populations is uncertain (USFWS 2002). It appears that the breeding range in Alaska has substantially contracted, with the species disappearing from much of its historical range in western Alaska (USFWS 2000c). The size of the breeding population on the Alaskan North Slope varies considerably among years and it is not known whether the population is currently declining, stable, or improving (USFWS 2000c).

The designated critical habitat for the Steller's eider includes five units along the Bering Sea and north side of the Alaskan Peninsula (Tetra Tech 2005a). These are the Y-K Delta, Kuskokwim Shoals, Seal Islands, Nelson Lagoon, and Izembek Lagoon (USFWS

2001). Within these areas, the primary habitat components that are essential include areas to fulfill the biological needs of feeding, roosting, molting, and wintering. Important habitats include the vegetated intertidal zone and marine waters up to 9 meters (30 feet) and the underlying substrate and benthic community, associated interbrate fauna, and where present, eelgrass beds and associated biota (USFWS 2001).

No critical habitat is designated within the geographical within the geographical area of the proposed NPDES general permit for oil and gas exploration, development, and production facilities in Cook Inlet, Alaska (Tetra Tech 2005a).

6.2.3 Marine Mammals

6.2.3.1 Blue Whale (Baleaptera musculus)

The blue whale was listed as endangered under the ESA on June 2, 1970. Blue whales are found in all of the world's oceans from the Arctic to the Antarctic. In the North Pacific, they rarely enter the Bering Sea and are only seldom seen as far north as the Chukchi Sea (ADFG 1994a). In the eastern North Pacific, they winter off southern and Baja California; during the spring and summer, they are found from central California northward through the Gulf of Alaska (Tetra Tech 2005a). Historical areas of concentration in Alaska include the eastern Gulf of Alaska and the eastern and far western Aleutians (ADFG 1994a).

Blue whales are believed to migrate away from coastlines and feed preferentially in deeper offshore waters (Gregr and Trites 2001; Mizroch et al. 1984). They are seldom seen in nearshore Alaska waters (ADFG 1994a). These preferences make it highly unlikely that blue whales would frequent Cook Inlet waters within the area of coverage of the proposed NPDES general permit (Tetra Tech 2005a).

Blue whales are estimated to reach sexual maturity between 5 and 10 years of age, and may live as long as 70 to 80 years (Environment Canada 2004b). Upon reaching sexual maturity, females bear a single calf every 2 to 3 years (ADFG 1994a). Like many other species of baleen whales, blue whales migrate from low-latitude wintering areas to high-latitude summer feeding grounds (Tetra Tech 2005a).

Blue whales appear to practice more selective behavior in feeding than other rorquals (those baleen whales that possess external throat grooves during gulp-feeding) and specialize in plankton feeding, particularly swarming euphausids (krill) in the Antarctic (Tetra Tech 2005a). In the North Pacific, the species *Euphausia pacifica* and *Thysanoessa spinifera* are the main foods of blue whales (ADFG 1994a).

The pre-whaling abundance of blue whales in the North Pacific has been estimated at 4,900 to 6,000 animals and is now to 1,200 to 1,700 animals (ADFG 1994a). There have been very few sighting of blue whales in Alaskan waters (Tetra Tech 2005a). The first confirmed blue whale sighting in 30 years was observed by NOAA scientists on July 15, 2004, 100 nautical miles southeast of Prince William Sound (Joling 2004).

No critical habitat has been designated for the blue whale (Tetra Tech 2005a).

6.2.3.2 Fin Whale (Balaenoptera physalus)

The fin whale was listed as endangered under the ESA on June 2, 1970. In the North Pacific Ocean, fin whales can be found from above the Arctic Circle to lower latitudes of approximately 20ºN (Leatherwood et al. 1982). Fin whales along the Pacific coast of North America have been reported during the summer months from the Bering Sea to as far south as central Baja California (Tetra Tech 2005a); three stocks are recognized: Alaska (Northeast Pacific), California/Washington/Oregon, and Hawaii (Angliss and Lodge 2003; NMFS 2003b).

Fin whales are believed to feed preferentially mainly in offshore waters, with preferred habitat encompassing a large area that includes the continental shelf break and offshore waters (Gregr and Trites 2001). They are seldom seen in inshore coastal waters. Fin whales regularly inhabit areas near NPDES permit coverage including Shelikof Strait, bays along Kodiak Island (especially Uganik and Uyak bays on the wet side), and the Gulf of Alaska. Some or all of these areas are feeding areas for fin whale (Tetra Tech 2005a). Sighting data suggest that the distribution and abundance of fin whales in these areas vary seasonally, but there is documented use in the vicinity of Kodiak Island every month of the year except December and January (MMS 2003).

Fin whales tend to be more social than other rorquals, gathering in pods of 2-7 whales or more. Sexual maturity occurs at ages of 6–10 years in males and 7–years in females, and may live as long as 90 years of age (OBIS 2005). Reproductive activity occurs in winter, when whales have migrated to warmer waters. Females can mate every 2 to 3 years (Tetra Tech 2005a).

Fin whales eat a variety of fish and zooplankton species including capelin, sandlance, herring, and euphausids (krill) (OBIS 2005).

The pre-whaling abundance of fin whales in the North Pacific has been estimated at 42,000 to 45,000 animals; estimates in the early 1970s range from 14,620 to 18,630 whales (Ohsumi and Wada 1974). There have been very few sightings of fin whales in Alaska waters (Tetra Tech 2005a). A survey conducted in August 1994 covering 2,050 nautical miles of track line south of the Aleutian Islands encountered only 4 fin whale groups (NMFS 2003b).

No critical habitat has been designated for the fin whale (Tetra Tech 2005a).

6.2.3.3 Humpback Whale (Megaptera novaengliae)

The humpback whale was listed as endangered under the ESA on June 2, 1970. The humpback whale is distributed worldwide in all ocean basins, although it is less common in Arctic waters. Currently there are four recognized stocks of humpback whales in U.S. waters based on geographically distinct winter ranges (NMFS 2005b): Gulf of Maine stock, eastern North Pacific stock, central North Pacific stock, and the western North Pacific stock. The central North Pacific stock includes animals found in Alaskan waters. In Alaskan waters, most humpbacks tend to concentrate in southeast animals found in Alaskan waters. In Alaskan waters, most humpbacks tend to concentrate in southeast Alaska, Prince William Sound, the area near Kodiak and Barren Islands, the area between the Semidi and Shumagin Islands, eastern Aleutian Islands, and the southern Bering Sea (ADFG 1994b). In inside waters off southeastern Alaska (i.e., Glacier Bay and Frederick Sound) photo-identification studies summarized by Perry et al. (1999) appear to show that humpback whales use discrete, geographically isolated feeding areas that individual whales return to year after year. These studies find little documented exchange in individual animals between Prince William Sound areas and the Kodiak Island area, and between the Kodiak Island area and southeast Alaska feeding areas, suggesting that while movement among these areas may occur, it is reasonably uncommon (Tetra Tech 2005a).

Although humpback whales can be observed year-round in Alaska, most animals migrate during the fall to temperate tropical wintering areas where they breed and calve (Tetra Tech 2005a). Most whales that spend the summer to Alaskan waters are thought to migrate to winter in waters near Hawaii (ADFG 1994b; Perry et al. 1999). In the summer, humpback whales regularly are present and feeding in areas near and within the Cook Inlet lease-sale area, including Shelikof Strait, bays of Kodiak Island, and the Barren Islands, in addition to the Gulf of Alaska adjacent to the southeast side of Kodiak Island (especially Albatross Banks), the south sides of the Kenai and Alaska peninsulas, and south of the Aleutian Islands. There is some evidence of a discrete feeding aggregation of humpbacks in the Kodiak Island region. Humpbacks also may be present in some of these areas throughout the autumn. Within the proposed lease-sale area, large numbers of humpbacks have been observed in late spring and early summer feeding near the Barren Islands. Humpbacks have also been observed feeding near the Kenai Peninsula north and east of Elizabeth Island (MMS 2003).

Humpback whale feed preferentially over continental shelf waters (Gregr and Trites 2001) and are often observed relatively close to shore, including major coastal embayments and channels (NMFS 2005b).

Humpback whales are seasonal migrants. The whales mate and give birth while in wintering areas outside of Alaskan waters (Tetra Tech 2005a). Sexual maturity occurs at age 4–6 years, with mature females giving birth every 2–3 years (ADFG 1994b). During spring, the whales migrate back to feeding areas in Alaskan waters, where they spend the summer (ADFG 1994b; Perry et al 1999).

Humpback whales use a variety of feeding behaviors to catch food including underwater exhalation of columns of bubbles that concentrate prey, feeding in formation, herding of prey, and lunge feeding (ADFG 1994b). On the basis of their diet, humpbacks have been classified as generalists (Perry et al. 1999). They have been known to prey upon euphausids (krill), copepods, juvenile salmonids (*Oncorhynchus spp.*), Arctic cod (*Boreogadus saida*), capelin (*Mallotus villosus*), Pacific herring (*Clupea harengus pallasi*), sand lance (*Ammodytes hexapterus*), walleye pollock (*Theragra chalcogramma*), pollock (*Pollachius virens*), pteropods; and some cephalopods (Tetra Tech 2005a). On Alaska feeding grounds, humpback whales feed primarily on capelin, juvenile walleye pollock, sand lance, Pacific herring, and krill (NMFS 2003c; Perry et al. 1999).

The pre-whaling abundance of humpback whales in the North Pacific has been estimated to be approximately 15,000 animals (ADFG 1994b). The current total estimated abundance of the Central North Pacific stock of humpback whales is 4,005 individuals (NMFS 2005b). NMFS (2005b) reports abundance within known feeding areas in Alaska as southeast Alaska (961 whales), Kodiak Island area (651 whales), and Prince William Sound (149 whales). At least some portions of this stock have increased in abundance between the early 1800s and 2000 (Tetra Tech 2005a). The rate of population increase in southeast Alaska may have recently declined, which may indicate the stock is approaching its carrying capacity (NMFS 2005b).

No critical habitat has been designated for the humpback whale anywhere throughout their range (Tetra Tech 2005a).

6.2.3.4 North Pacific Right Whale (Eubalaena japonica)

The northern right whale (*Balaena glacialis*) was listed as endangered under the ESA on June 2, 1970. On April 10, 2003, the NMFS published a final rule (NMFS 2003a) that split the endangered northern right whale into two endangered species: North Atlantic right whale (*Eubalaena glacialis*) and North Pacific right whale (*Eubalaena japonica*) (Tetra Tech 2005a). This section discusses the North Pacific right whale.

The North Pacific stock of northern right whale has historically occurred across the North Pacific, north of 35ºN latitude, with concentrations of whales occurring in the Gulf of Alaska, eastern Aleutian Islands, south-central Bering Sea, Sea of Okhotsk, and the Sea of Japan (NMFS 2001).

Two populations of North Pacific right whale are thought to exist, one in the western North Pacific off Russia and the other in the eastern North Pacific off Alaska (MMC 2002). The distribution and status of neither population is well understood. The eastern population is more severely depleted than the western population, with the population thought to number in the tens of individuals versus hundreds for the western population (MMC 2002; NMFS 2005a). Between 1900 and 1994, there have been only 29 reliable sightings of right whales in the eastern North Pacific (Tetra Tech 2005a). Since that time, between 4 and 13 individuals have been sighted each year; all these sightings have occurred in a 60 by 100 nautical mile area about 200 nautical miles north of Unimak Pass in the southeastern Bering Sea (CBD 2000; MMC 2002; NMFS 2002a).

Because the North Pacific eastern population is so small and infrequently sighted, little is known about their range and movements (Tetra Tech 2005a). The whales are thought to move northward to high latitudes in the spring, summer in the Bering Sea and Gulf of Alaska, and move southward in the fall and winter possibly as far south as Baja, California (CBD 2000; NMFS 2002a).

Historically, right whales often were observed in coastal waters where their slow speed and tendency to float after death resulted in their near-decimation by whalers in the 1800s. Recent whale sightings have all occurred within the shallower waters of the continental shelf (CBD 2000). No information currently exists regarding the presence of this species in Cook Inlet, Alaska (Tetra Tech 2005a).

The pre-exploitation size of the population of North Pacific right whales has been estimated as likely exceeding 10,000 animals (67 FR 7660, February 20. 2002) to 19,000 animals (CBD 2000). The current population is thought to be very small, perhaps in the tens of animals (Tetra Tech 2005a). No sightings of a cow with a calf have been confirmed since 1900 (NMFS 2002b).

Among baleen whales, right whales appear to have the most specialized feeding strategy (Tetra Tech 2005a). Studies conducted in the North Atlantic suggest that right whales require high densities of copepods concentrated in surface waters for effective feeding; the feeding requirements of an adult whale are estimated to be at least 4.07 x 105 Kcal/day (CBD 2000). The feeding preferences of North Pacific right whales have not been determined; however, the NMFS has noted that these whales probably feed almost exclusively on calanoid copepods, a component of zooplankton (NMFS 2002b).

On June 3, 1994, the NMFS designated critical habitat for the species of northern right whale (NMFS 1994a), which as of April 10, 2003, became referred to as the North Atlantic right whale (NMFS 2003a). The three areas designated as critical habitat are in the North Atlantic Ocean off the eastern United States. NMFS determined at the time that insufficient information was available to consider critical habitat designation for other stocks of northern right whale, including whales residing in the North Pacific (Tetra Tech 2005a).

On October 4, 2000, the Center for Biological Diversity petitioned the NMFS to designate a portion of the southeastern Bering Sea as critical habitat for the North Pacific right whale on the basis of annual sightings of whales in the area that suggests the area is a summer feeding ground for this severely depleted population (CBD 2000). On July 11, 2001, the Marine Mammal Commission responded to this request by recommending that NMFS proceed with designating the area as critical habitat and modify the boundaries as future data about future population distribution becomes available (MMC 2002). However, on February 20, 2002, NMFS published notice that the Service had determined that the petitioned action to designate critical habitat was not warranted (NMFS 2002b) noting that because the essential biological requirements of the population in the North Pacific Ocean are not sufficiently understood, the extent of critical habitat cannot be determined. No critical habitat has been designated for the Northern Pacific right whale (Tetra Tech 2005a).

6.2.3.5 Sei Whale (Balaenoptera borealis)

The sei whale was listed as endangered under the ESA on June 2, 1970. Sei whales have historically occurred in all oceans of the world, migrating from low-latitude wintering areas to high-latitude summer feeding grounds (Fisheries and Oceans Canada 2005). In the eastern North Pacific, sei whales are common in the southwest Bering Sea to the Gulf of Alaska (Tetra Tech 2005a), and offshore in a broad arc about 40ºN and 55ºN (Environment Canada 2004a; WWF 2005).

The sei whale prefers deeper offshore waters, with preferred habitat tending to occur in offshore areas that encompass the continental shelf break (Gregr and Trites 2001). Commercial whaling catch records off British Columbia indicate that less than 0.5 percent of sei whales were caught in waters over the continental shelf (Environment Canada 2004a). These preferences make it unlikely that sei whales would frequent Cook Inlet waters within the geographic area covered by the proposed NPDES general permit (Tetra Tech 2005a).

Sei whales reach sexual maturity between 5 and 15 years of age and may live as long as 60 years. Like many other species of baleen whales, sei whales migrate from low-latitude wintering areas to high-latitude summer feeding grounds. Catch records suggest that whale migrations are segregated according to length (age), sex, and reproductive status (Tetra Tech 2005a). Pregnant females appear to lead the migration to feeding grounds, while the youngest animals arrive last and depart first (Environment Canada 2004a). Sei whales feed primarily on copepods, followed by squid, euphasids, and small pelagic fish (Trites and Heise 2005).

The pre-whaling abundance of sei whales in the North Pacific has been estimated to range from 42,000-62,000 animals (Ohsumi and Wada 1974; Tillman 1977). There are no current data on trends in sei whale abundance in the eastern North Pacific waters. A fact sheet prepared by NMFS (2000b) on the eastern North Pacific stock of sei whale suggest that the population is expected to have grown since being given protected status under the Marine Mammal Protection Act in 1976; however, continued unauthorized take, incidental ship strikes, and fill net mortality makes this uncertain (Tetra Tech 2005a).

No critical habitat has been designated for the sei whale (Tetra Tech 2005a).

6.2.3.6 Sperm Whale (Physeter macrocephalus)

The sperm whale was listed as endangered under the ESA on June 2, 1970. Sperm whales inhabit all ocean basins, from equatorial to polar waters. Their distribution generally varies by gender and the age composition of groups, and is influenced by prey availability and oceanic conditions (Perry et al. 1999). In the North Pacific, sperm whales are distributed widely, with the northernmost boundary extending from Cape Navarin (62ºN) to the Pribilof Islands (Angliss and Lodge 2003). Mature females, calves and immature whales of both sexes in the North Pacific are found in social groups, and remain in tropical and temperate waters year round from the equator to approximately 45ºN latitude (Angliss and Lodges 2003; Perry et al 1999). Males lead a mostly solitary life after reaching sexual maturity between 9 and 20 years of age, and are thought to move north in the summer to feed in the Gulf of Alaska, Bering Sea, and waters around the Aleutian Islands (Tetra Tech 2005a). Research has revealed considerable east-west movement between Alaska and the western North Pacific (Japan and Bonin Islands), with little evidence of north-south movement in the eastern Pacific (Angliss and Lodge 2003; Perry et al 1999).

The habitat preferred by sperm whales differs among the sexes and age composition of individual whales (Tetra Tech 2005a). The social groups composed of females, calves, and immature whales have a broader habitat distribution than males; they are generally restricted to waters with surface temperatures greater than 15ºC and are rarely found in areas with water depths less than 200 to 1,000 meters (656 to 3,280 feet) (Gregr and Trites 2001; Reeves and Whitehead 1997). Males exhibit a tighter distribution over deeper waters along the continental shelf break, and are often found near steep drop-offs or other oceanographic features (e.g., offshore banks, submarine trenches and canyons, continental shelf edge), presumably because these areas have higher foraging potential (AKNHP 2005; Gregr and Trites 2001).

The distribution of sperm whales indicates that male sperm whales are the only sex that frequent Alaskan waters. Available evidence indicates that males are present offshore in the Gulf of Alaska during the summer, but they are very unlikely to be present in the permit coverage area in Cook Inlet (Tetra Tech 2005a).

Sperm whales appear to be organized in a social system that consists of groups of 10–40 adult females plus their calves, which remain year-round in tropical and temperate waters (Tetra Tech 2005a). Solitary males join these groups during the breeding season, which takes place in the middle of the summer (NMML 2004a). Males reach sexual maturity at 9–20 years of age (Perry et al 1999), but do not seem to take an actual part in breeding until their late 20s (ACS 2004). Female sperm whales reach sexual maturity at around 9 years of age and produce a calf approximately once every 5 years (NMFS 2005c).

Sperm whales feed primarily on medium-sized deep water squid, with the remaining portion of their diet composed of octopus, demersal and mesopelagic sharks, skates, and fish; feeding occurs all year-round, usually at depths below 122 meters (400 feet) (ACS 2004; AKNHP 2005; NMFS 2005c; NMML 2004a).

Pre-whaling abundance estimates of sperm whale in the North Pacific are considered unreliable and range from 472,000 to 1,260,000 animals (Angliss and Lodge 2003; Perry et al 1999; NMFS 2005c). The abundance of whales in the North Pacific in the 1970s was estimated to be 930,000 animals (Rice 1989). The current abundance of the North Pacific stock (Alaska) of sperm whale is unknown (NMFS 2005c).

No critical habitat has been designated for the sperm whale (Tetra Tech 2005a).

6.2.3.7 Steller Sea Lion (Eumetopias jubatus)

The NMFS listed the Steller sea lion as threatened, by emergency interim rule, on April 5, 1990 (NMFS 1990a). The emergency rule listing, which had duration of 240 days, was followed by a final listing of the Steller sea lion as threatened on November 26, 1990 (NMFS 1990b). On May 5, 1997, the NMFS issued a final rule that reclassified Steller sea lions into two distinct population segments (NMFS 1997). The Steller sea lion population west of 144ºW longitude (a line intersecting the Alaskan coastline near Cape Suckling) was reclassified as endangered; the sea lion population to the east of this line retained its ESA-listing status as threatened (Tetra Tech 2005a).

The Steller sea lion is distributed around the North Pacific Ocean rim from northern Hokka, Japan along the western North Pacific northward through the Kuril Islands and Okhotsk Sea, then eastward through the Aleutian Islands and central Bering Sea, and southward along the eastern North Pacific to the Channel Islands, California (NMML 2004b). Two distinct populations (western and eastern) are thought to occur within this range, with the dividing line being designated as 144ºW longitude (NMFS 1997).

There is designated critical habitat for the Steller sea lion and other habitat considered as critical habitat by the NMFS within the lease-sale area at Cape Douglas, the Barren Islands, and marine areas adjacent to the southwestern Kenai Peninsula, and at the extreme southern end of Cook Inlet (Tetra Tech 2005a). There is additional critical habitat—including rookeries, haulouts, and marine foraging areas for the western population stock—in areas near the proposed lease-sale area, including Shelikof Strait, and areas along the southern side of the Alaska Peninsula (MMS 2003).

The breeding season for the Steller sea lion is from May to July, where the animals congregate at rookeries, the males defend territories, mating occurs, and the pups are born (Tetra Tech 2005a). Nonreproductive animals congregate to rest at more than 200 haulout sites where little or no breeding occurs. Bulls become sexually mature between 3 and 8 years of age, but typically are not able to gain sufficient size and successfully defend territory within a rookery until 9–10 years of age. Females reach sexual maturity and mate at 4–6 years of age and typically bear a single pup each year. Sea lions continue to gather at both rookeries and haulout sites throughout the year, outside of the breeding season (NMML 2004b). Habitat types that typically serve as rookeries or haulouts include rock shelves, ledges, and slopes and boulder, cobble, gravel, and sand beaches. Seasonal movements occur generally from exposed areas in summer to protected areas in winter (ADFG 1994c).

When foraging in marine habitats, Steller sea lions typically occupy surface and mid-water ranges in coastal regions (Tetra Tech 2005a). They are opportunistic predators and feed on a variety of fish [walleye pollock, Atka mackerel (*Pleurogrammus monopteryguius*), Pacific herring, capelin, sand lace, Pacific cod (*Gadus macrocephalus*), and salmon], and invertebrates (squid, octopus) (ADFG 1994c; NMML 2004b).

In 1980, the world population of Steller sea lions was estimated to be between 245,000 and 290,000 (Loughlin et al. 1992). The western population of Steller sea lions has declined at about 5.0 percent per year over the period of 1991-2000, while the eastern population has increased at about 1.7 percent per year (Loughlin and York 2000). According to recent survey data collected in 2003-2004, Fritz and Stinchcomb (2005) suggest that the decline of the western population within Alaskan territory may have abated in recent years, with an annual rate of increase estimated at 2.4 to 4.2 percent (Tetra Tech 2005a).

In 1993, NMFS issued a final rule designating critical habitat for the Steller sea lion, including all U.S. rookeries, major haulouts in Alaska, horizontal and vertical buffer zones (5.5 kilometers) around these rookeries and haulouts, and three aquatic foraging areas in north Pacific waters, including Sequam Pass, southeastern Bering Sea shelf, and Shelikof Strait (NMFS 1993b). This final rule was amended on June 15, 1994, to change the name of one designated haulout site from Ledge Point to Gran Point and to correct the longitude and latitude of 12 haulout sites, including Gran Point (NMFS 1994b).

Critical habitat includes a terrestrial zone that extends 0.9 kilometers (3,000 feet) landward from the baseline or base point of each major rookery and major haulout in Alaska (Tetra Tech 2005a). Critical habitat includes an air zone that extends 0.9 kilometers (3,000 feet) above the terrestrial zone of each major rookery and haulout area measured vertically from sea level. Critical habitat within the aquatic zone in the area east of 144ºW longitude (ESA endangered population) extends 20 nautical miles (37 kilometers) seaward in state and federally managed waters from the baseline or base point of each rookery or major haulout area (NMFS 1993).

6.2.3.8 Northern Sea Otter (Enhydra lutris kenyoni)

The USFWS issued a final rule listing the southwest Alaska distinct population segment of the northern sea otter as threatened under the ESA on August 9, 2005 (USFWS 2005). The overall range of the sea otter extends from northern Japan to southern California. There are three recognized subspecies of *Enhydra lutris*. *E. lutris kenyoni*, referred to as the northern sea otter, has a range that extends from the Aleutian Islands in southwestern Alaska to the coast of the state of Washington (USFWS 2005).

Sea otters generally occur in shallow water areas near the shoreline where they forage in shallow water (Tetra Tech 2005a). Visual observation of 1,251 dives by sea otters in southeast Alaska, indicates that foraging activities typically occur in water depths ranging from 2 to 30 meters (7 to 98 feet), although foraging at depths up to 100 meters (328 feet) was observed (Bodkin et al 2004).

Sea otter movements are influenced by local climatic conditions such as storm events, prevailing winds, and in some areas, tidal conditions (Tetra Tech 2005a). They tend to move to protected or sheltered waters during storm events of high winds (USFWS 2005). The animals usually do not migrate and seldom travel unless an area has become overpopulated or food is scarce (ADFG 1994d).

The home ranges of sea otters in established populations are relatively small. Sexually mature females have home ranges of 8–16 kilometers (5–10 miles). Breeding males remain for all or part of the year within the bounds of their territory, which constitutes the length of coastline from 100 meters (328 feet) to 1 kilometers (0.6 miles) (Tetra Tech

2005a). Male sea otters that do not hold territories may move greater distances between resting and foraging areas than territorial males (USFWS 2005).

Sea otters mate at all times of the year, and young may be born in any season; however, in Alaska, most pups are born in late spring (ADFG 1994d). Females typically give birth in the water, although they have been observed giving birth on shore (USFWS 2005). Male sea otters appear to reach sexual maturity at 5–6 years of age and have a lifespan of about 10–15 years (Tetra Tech 2005a). Female sea otters reach sexual maturity at 3–4 years of age and have a lifespan of about 15–20 years (USFWS 2005). Sea otters are gregarious and may become concentrated in an area, sometimes resting in pods of fewer than 10 to more than 1,000 animals (ADFG 1994d).

The search for food is one of the most important daily activities of sea otters, as large amounts are required to sustain the animal in healthy condition (Tetra Tech 2005a). Sea urchins, crabs, clams, mussels, octopus, other marine invertebrates, and fishes make up the normal diet of sea otters (ADFG 1994d).

Prior to commercial exploitation, the world population of sea otter in the North Pacific Ocean was estimated to be between 150,000–300,000 individuals (USFWS 2005). Over the next 170 years, sea otters were hunted to the brink of extinction first by Russian and later by American fur hunters (Tetra Tech 2005a). Sea otters became protected under the International Fur Seal Treaty of 1911; at that time the entire population may have been reduced to 1,000–2,000 animals (USFWS 2005).

By the 1980s, sea otters in southwest Alaska had increased in abundance and recolonized much of their former range. The population in southwest Alaska is currently estimated at 41,865 animals (USFWS 2005); 15 percent (6,284 animals) of this total occur within the Kodiak Archipelago, which lies near the geographic area of the proposed NPDES general permit (Tetra Tech 2005a).

No critical habitat has been designated for the northern sea otter (Tetra Tech 2005a).

6.2.3.9 Beluga Whale (Delphinapterus leucas)

Beluga whales are one of the two members of the family Monodontidae and are divided into five stocks on the basis of mitochondrial DNA analyses: Cook Inlet, Bristol Bay, eastern Bearing Sea, eastern Chukchi Sea, and Beaufort Sea (NMFS 2003a). The Cook Inlet stock of beluga whales was placed on the ESA candidate list in 1991 (NMFS 1991). The stock was more recently determined to be depleted under the Marine Mammal Protection Act (NMFS 2000c).

NMFS stock assessment reports estimate the combined population of the five beluga whale stocks in U.S. waters at nearly 60,000 individuals (NMFS 2005d). NMFS reports that the population trends for the Beaufort Sea and Eastern Bering Sea stocks are unknown; these two stocks account for over 90 percent of the estimated population of beluga whales in U.S. waters (NMFS 2005d). The population of the Eastern Chukchi stock, consisting of 3,710 individuals, shows no evidence of decline, and NMFS considers the population of the Bristol Bay stock (1,619) to be stable to increasing (NMFS 2005d). From the range of numbers reported, NMFS estimates that the population in the mid-1980s was between 1,000 to 1,300 individuals (Tetra Tech 2005a). Population trend analyses conducted on the Cook Inlet stock between June 1994 and June 1998 were constrained by the limited data available but showed a high probability that a 40 percent decline in the population had occurred during the time period (NMFS 2000d; NMFS 2005d).

NMFS included the Cook Inlet beluga whale stock on the candidate list of threatened and endangered species in 1991 (NMFS 1991). No further action was taken immediately following although NMFS received two petitions in 1999 to list the Cook Inlet stock under the ESA (NMFS 2000c) resulting in the Cook Inlet stock being designated as depleted under the MMPA (NMFS 2000d). Subsequent investigations assessed natural and human-induced sources of potential impacts that included:

- Habitat capacity and environmental change
- Strandings events
- Predation
- Subsistence harvest
- Commercial fishing
- Oil and gas development

The investigations concluded that subsistence harvests presented the most immediate threat to the stock. Although NMFS found that other potential sources of impact could have some negative effect on recovery, none were considered significant (NMFS 2000c). Population surveys since the imposition of mandatory and voluntary restrictions on subsistence harvests in 1999 show no clear trend and no indication that the population is increasing (NMFS 2005e). As a result, NMFS developed the *Draft Conservation Plan for the Cook Inlet Beluga Whale (Delphinapterus leucas)* in 2005 to establish goals and objectives that can be achieved cooperatively to promote the recovery of the Cook Inlet beluga whale population. The goals and objectives apply to a range of potential sources of impacts including those identified above as well as shoreline development, vessel traffic, and noise (Tetra Tech 2005a).

Critical habitat is not applicable to this species because it is not designated under the ESA (Tetra Tech 2005a).

6.3 EFFECTS OF PERMITTED DISCHARGES ON THREATENED AND ENDANGERED SPECIES

This section summarizes potential impacts on threatened and endangered species from discharges from oil and gas exploration, development, and production facilities in state and federal waters covered under the proposed NPDES general permit for Cook Inlet, Alaska. The discharges are described in Section 2.2. Potential impacts of these discharges on threatened and endangered species were evaluated as part of a Biological Evaluation (BE) prepared for the Cook Inlet proposed NPDES general permit (Tetra Tech 2005a) in compliance with Section 7 of the ESA. Conclusions of the BE are summarized below.

6.3.1 Snake River Fall-Run Chinook Salmon and Snake River Spring/Summer-Run Chinook Salmon

Assuming the possibility that Snake River fall-run chinook salmon and Snake River spring/summer run chinook salmon may occur within the permit area, the potential for impacts is extremely low. Salmon are mobile and unlikely to spend substantial periods of time within discharge mixing zones; previous work has determined that exposure to discharged pollutant concentrations equal to Alaska water quality standards are not likely to adversely affect this species. The discharge of drilling fluids and cuttings could potentially be a source of localized impacts; however, those activities are limited to existing discharges. Existing discharges are found in the northern portion of Cook Inlet, where habitat values are poorer due to naturally high turbidity levels and strong currents. If Snake River fall-run salmon were to be exposed to facilities covered by the proposed NPDES general permit, it would more likely be the new source facilities that would occur in the better quality habitat in the southern portion of Cook Inlet. The proposed NPDES general permit prohibits the discharge of drilling fluids and cuttings from these facilities reducing the potential for even localized impacts (Tetra Tech 2005a).

The discharges authorized under the proposed NPDES general permit are unlikely to adversely affect Snake River fall-run chinook salmon and the Snake River spring/summer run chinook salmon or their habitat in Cook Inlet. The issuance of the proposed NPDES general permit therefore is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.2 Snake River Sockeye Salmon

Data on the ocean distribution of Snake River sockeye salmon are limited due to the size of the population and difficulties with sampling methodology. Information available more broadly for Washington and British Columbia stocks indicate that they reach the Gulf of Alaska. Within the Gulf of Alaska, these stocks' northernmost distribution is limited to the area south and east of Kodiak Island (Burgner 1991). Because the Snake River sockeye ESU can be assumed to be distributed similarly to the other Washington and British Columbia, Cook Inlet is outside the known range of the Snake River sockeye ESU. The issuance of the proposed NPDES general permit therefore is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.3 Short-tailed Albatross

Cook Inlet waters are not part of the typical geographic range of the species. Discharges from oil and gas exploration, development, and production facilities will not have an affect on breeding or foraging activities to support fledgling chicks. Adult birds may occasionally occur within the proposed NPDES general permit's coverage area. Under the proposed NPDES general permit, existing facilities are allowed to discharge produced waters in the northern portion of Cook Inlet, but these discharge areas are far from the preferred pelagic habitat of the adult birds of this species. Considering the geographic distribution of the short-tailed albatross, the low probability that this species will use waters in close proximity to permitted activities, and the conclusion that permitted actions would have little effect on the bird's behavior, foraging ability, or prey species, it is concluded that the issuance of the proposed NPDES general permit may affect, but is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.4 Steller's Eider

Steller's eiders are not reported to nest in any locations within or near the proposed NPDES general permit's coverage area. Molting and winter habitat, however, is thought to extend throughout southern Cook Inlet, approximately as far north as Trading Bay (USFWS 2003). All the existing oil and gas production facilities are in northern Cook Inlet and, with the exception of the East Foreland facilities, appear not to fall within the mapped winter habitat. The birds would not be expected to occupy areas within the designated mixing zones because of their preference for nearshore, shallow foraging habitat. Exposure to discharge waters that comply with chronic water quality standards are not expected to adversely affect Steller's eiders. The potential impacts to Steller's eiders from the discharge of drilling fluids and cuttings authorized under the proposed NPDES general permit are expected to be insignificant. Any effects on the deposition of drilling fluids that could alter the benthic habitat and adversely affect shallow water mollusks and crustaceans that Steller eiders feed upon would extend over a very small fraction of the bird's available winter range and would not noticeably impact overall prey abundance and availability (Tetra Tech 2005a).

The issuance of the proposed NPDES general permit may affect, but is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.5 Blue Whale

Available evidence indicates that blue whales are unlikely to inhabit Cook Inlet waters at any time of the year. While they are seasonally present in the Gulf of Alaska, they are typically offshore and relatively rare (MMS 2003). The issuance of the proposed NPDES general permit is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.6 Fin Whale

Fin whales are unlikely to spend substantial amounts of time within discharge mixing zones, and previous work has determined that exposure to discharged pollutant concentrations equal to the Alaska water quality standards are not likely to adversely affect this species (Tetra Tech 2005a). The discharges authorized under the proposed NPDES general permit are unlikely to adversely affect fin whales or their habitat in Cook Inlet. The issuance of the proposed NPDES general permit is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.7 Humpback Whale

Humpback whales are unlikely to spend substantial amounts of time within discharge mixing zones, and previous work has determined that exposure to discharged pollutant concentrations equal to the Alaska water quality standards are not likely to adversely affect this species. Issuance of the proposed NPDES general permit is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.8 Northern Right Whale

There is no evidence that northern right whales ever inhabited Cook Inlet waters. These whales do occur in the Gulf of Alaska, and any impacts to this species would be significant given their extremely small population size. However, because this species is extremely rare in Alaskan waters and only occurs in waters well outside the action area, it is concluded that the issuance of the proposed NPDES general permit is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.9 Sei Whale

It is very unlikely that Sei whales would occur in any areas impacted by discharges authorized under the proposed NPDES general permit. The issuance of the proposed NPDES general permit is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.10 Sperm Whale

It is very unlikely that sperm whales would occur in any areas impacted by discharges authorized under the proposed NPDES general permit. The issuance of the proposed NPDES general permit is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.11 Northern Sea Otter

Drilling fluid discharges could adversely affect local otter populations that forage in the vicinity of these discharges by altering prey availability due to the burial of benthic organisms or changes in bottom habitat characteristics. Exposures to increased pollutant concentrations within designated mixing zones and exposure to discharged waters that comply with chronic water quality standards are not expected to adversely affect northern sea otters. Although the proposed NPDES general permit prohibits discharge of free oil, the oil and gas operations regulated under the permit do pose a potential risk to northern sea otters from oil spills. The issuance of the proposed NPDES general permit may affect, but is *not likely to adversely affect (NLAA)* this species (Tetra Tech 2005a).

6.3.12 Steller Sea Lion

The Steller sea lion is the only ESA-listed species with designated critical habitat within the geographic area of coverage for the proposed NPDES general permit. Critical habitat occurs at Cape Douglas, the Barren Islands, and marine areas adjacent to the southwestern Kenai Peninsula (Tetra Tech 2005a). There is additional critical habitat including rookeries, haulouts, and marinee foraging areas for the western population of sea lions in areas near the proposed NPDES general permit action area within the Shelikof Strait and areas along the southern side of the Alaska Peninsula (MMS 2003).

Drilling fluid discharges are unlikely to adversely impact the Steller sea lion because critical habitat restrictions do not allow discharges in the vicinity of Steller sea lions. Also, the rapid dilution and low toxicity of drilling fluids discharged in Cook Inlet imply that these discharges would not be likely to adversely affect pollock or other Steller sea lion prey (Tetra Tech 2005a).

Exposure to increased pollutant concentrations within designated mixing zones and exposure to discharge water that comply with chronic water quality standards are not expected to adversely affect Steller sea lions. It is unlikely that this species will be adversely impacted by noise associated with oil and gas exploration, development, and production activities due to the critical habitat restrictions that prevent aircraft and vessels from operating near critical habitat (Tetra Tech 2005a).

The discharges authorized under the proposed NPDES general permit are *not likely to adversely affect (NLAA)* the western population of Steller sea lions (Tetra Tech 2005a).

6.4 DEPLETED STOCK ASSESSMENT FOR BELUGA WHALE

Beluga whales have been observed throughout Cook Inlet but are concentrated in the in tidal flats, river mouths, and estuaries in the northern portions of the inlet throughout the summer. The whales are thought to move to deeper waters in winter, ranging as far south as Chinitna Bay and Tuxedni Bay, although they have been observed in the Knik and Turnagin arms in February and March (NMFS 2005f). The draft conservation plan for the Cook Inlet beluga whale stock identifies the Knik and Turnagin arms, Chickaloon Bay, and at the mouths of rivers as the highest value and most sensitive habitat for the whales (NMFS 2005f). Proposed NPDES general permit activities would occur outside the high summer concentration areas in Type 1 and Type 2 habitats as identified in the draft conservation plan as a result of ADNR restrictions on the location of oil leases in the upper Cook Inlet and the proposed NPDES general permit's prohibition of activities within 4,000 meters of the mouth of a river, river delta, or coastal marsh. During winter, when beluga whales are distributed more widely throughout the inlet, the whales occur within the area covered by the proposed NPDES general permit (Tetra Tech 2005a).

Drilling fluid discharges could adversely affect prey availability in the immediate vicinity of the discharges because of the burial of benthic organisms, or changes in bottom habitat characteristics. Such effects would be of limited size and duration. Exposure to increased pollutant concentrations within designated mixing zones are unlikely to cause adverse effects to beluga whales because of the whales' mobility and limited amount of time within spent within these areas. Exposure to discharge waters that comply with chronic water quality standards are not expected to adversely affect beluga whales (see Section 5.1.3.2) (Tetra Tech 2005a).

The proposed NPDES general permit has been developed with consideration of the protection measures, including the avoidance of Type 1 and 2 habitats outlined in the NMFS draft conservation plan. The discharges authorized under the proposed NPDES general permit may affect individual beluga whales either directly or indirectly; however, they are not likely to contribute to a further decline of the Cook Inlet beluga whale stock or affect the recovery of the population as a whole (Tetra Tech 2005a).

6.5 SUMMARY

The cumulative impact analysis summarized in the Cook Inlet proposed NPDES general permit BE (Tetra Tech 2005a) considers the past and current lease sale activities; past oil and gas exploration and production; oil and gas discoveries that have a reasonable chance of being developed during the next 15 to 20 years; and speculative exploration and development of additional undiscovered resources (onshore and offshore) that could occur during the next 15 to 20 years. The results of this analysis indicate that discharges from production facilities and routine other discharges associated with oil production are not expected to have cumulative effects based on the modeling conducted for the permit reissuance. Therefore, no cumulative effects would be expected to threatened and endangered species. Also, it was determined in the BE that there are no interdependent or interrelated actions expected as a result of the issuance of this proposed NPDES general permit.

On the basis of the Cook Inlet tidal flux, the anticipated volumes of wastewater discharge, and the contribution of the oil and gas exploration, development, and production to the cumulative loading of waste discharges in Cook Inlet, the Cook Inlet proposed NPDES general permit BE concluded that discharges from these facilities will likely have no adverse effects on the marine mammal and bird species described above or to critical habitat associated with these species.

7.0 COMMERCIAL, RECREATIONAL, AND SUBSISTENCE HARVEST

This section describes the commercial, recreational, and subsistence fisheries in Cook Inlet, and the potential impact of discharges from exploration, development, and production operations in the areas covered under the proposed NPDES general permit for Cook Inlet.

7.1 COMMERCIAL HARVESTS

Commercial fishing has long been a major economic sector for the Cook Inlet area. The Alaska Department of Fish and Game (ADFG) is responsible for management of the commercial fisheries in Alaska. Commercial fisheries in these waters include salmon, herring, groundfish (halibut, lincod, rockfish, sablefish, pollock, and Pacific cod), and shellfish (crab, shrimp, scallops, and clams) (MMS 2003).

The groundfish fishery in the Cook Inlet area is very limited and is estimated to have contributed less than 1 percent of the state's total value for groundfish for many years. The value of the halibut landed in the Central Region of Alaska (most coming from the Cook Inlet) was 26 percent of the state's total for halibut (MMS 2003).

Cook Inlet has supported commercial shellfish fisheries for red king, tanner, and Dungeness crabs; the weathervane scallop; hard-shell clams; razor clams; and shrimp. Due to low abundance levels in the Cook Inlet area, the fisheries for red king, tanner, and Dungeness crabs and for shrimp have been closed for some time. The fisheries for weathervane scallops and hard-shell and razor clams remain open in the Cook Inlet area (MMS 2003).

Pacific herring are harvested annually in Cook Inlet. They are mainly used for their roe and sac-roe-on-kelp, which is marketed in Pacific Rim countries. Harvests in the upper Cook Inlet area have averaged well under 400 tons a year (less than $200,000 ex-vessel value), which makes it one of the smallest herring fisheries in the state. Most of the herring fisheries in the northern Cook Inlet have been closed and since 1998. The ex-vessel value of the upper Cook Inlet herring fishery has dropped to less than $20,000 per year. From 1973 to 1998, ex-vessel values in the Kamishak Bay district have ranged from $70,000 to $9,300,000. The Kamishak Bay fishery was closed in 1999 due to low stock abundance (MMS 2003).

All five species of Pacific salmon are harvested commercially (as well as for subsistence and sport) in Cook Inlet. Cook Inlet fisheries use purse seines, drift gillnets, set gillnets, and, in small numbers, beach seines. The regional salmon fisheries commence in early May and continue well into September each year. The ex-vessel value of salmon landed in Cook Inlet has been declining with a high of $35.2 million in 1997 to a low of $8.8 million in 2001 (MMS 2003).

The groundfish fishery is the largest commercial fishery in Alaska by volume and value. The lower Cook Inlet longline fishery primarily harvests sablefish (black cod), Pacific cod, and halibut. Groundfish landings and ex-vessel earnings in the Cook Inlet area for sablefish, rockfish, lingcod, Pacific cod, Pollock, and others species have varied substantially over time. Halibut is the major commercial groundfish fishery in the Cook Inlet area with landings (Homer, Kenai, Ninilchik, Seldovia, and Seward) totaling 15,346,912 pounds in 2000 and 19,787,911 pounds in 2001. Due to low stock abundance, the 2002 Cook Inlet fishery for pollock is closed, except for bycatch. Also, for this reason, the sablefish, rockfish, and lingcod fisheries of the Cook Inlet area are subject to short seasons, emergency orders, gear restrictions, trip limits, restricted fishing locations, parallel or directed fishery restrictions, or several of the above. The 2002 Cook Inlet fishery for Pacific cod is bycatch only for longline gear, but is open to pot and jig gear (with some conditions) (MMS 2003).

7.2 RECREATIONAL FISHERY

Recreational (sport) fisheries of Cook Inlet were described in the *Cook Inlet Planning Area Oil and Gas Lease Sales 191 and 199 Final Environmental Impact Statement* (MMS 2003), which includes the area covered under the proposed NPDES general permit. Relevant information from this EIS is provided below (MMS 2003).

The marine sport fisheries of Cook Inlet are the focus of a large and growing recreation-based economic sector. Sport fishing provides monetary benefits to tourism-related businesses. Sport fishing in Cook Inlet is primarily for Pacific halibut. The marine salmon fishery (i.e., chinook and coho) is both a substitute and complement for the halibut sport fishery. The number of vessels licensed for sport or sport/commercial fishing off Alaska has increased steadily from 500 in 1984 to more than 1,500 in 1996. The person-days fishing on charters in lower and central Cook Inlet during 1997 totaled approximately 79,000; on private or bare-boat charters, 91,000; and shore-based, 28,000—with the total of all modes being 198,000. Sport fishers include local fishers from the Kenai Peninsula, other Alaskans (from outside the Kenai Peninsula), and nonresidents of Alaska. The average daily expenditures for lower and central Cook Inlet sport-fishing trips in 1997 and 1998 ranged from $32 for a local resident fishing from shore to $294 for a nonresident of Alaska on a charter. The total expenditures by all sport fishers fishing in lower and central Cook Inlet directly attributable to a saltwater halibut and salmon fishing trip in 1997 was $34 million (MMS 2003).

The sport-fishing charters and shore-based fishing include: Anchor River, Whiskey Gulch, Deep Creek, and Ninilchik River; other Cook Inlet and Gulf Coast areas west of Gore Point; other Cook Inlet areas north of the Ninilchik River; Barren Islands, Seldovia; Homer Spit; and various points along the shoreline (derived from Herrmann, et al. 2001; Lee et al. 1999). The saltwater sport fishery in Cook Inlet, fresh water sport fishery on the Kenai Peninsula, and clamming on the shores of Cook Inlet are an important part of the overall economy (MMS 2003).

7.3 SUBSISTENCE HARVESTS

The Alaska National Interest Land Conservation Act defines subsistence as customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing for personal or family consumption; and for customary trade (16 USC Section 3113). Subsistence hunting, fishing, and trapping occur year-round throughout the entire Cook Inlet region. Subsistence foods include salmon, other fish, big game, small game and furbearers, marine mammals, birds and eggs, marine invertebrates, and plants and berries. The harvest and use of these foods represent activities with significant social and cultural meaning as well as economic importance, especially within Alaskan Native communities. Subsistence activities are given the highest cultural values by local Cook Inlet Dena'ina, Kenaitze, Alutiiq, and Koniag Native harvesters and provide a sense of identity in addition to being an important economic pursuit (MMS 2003).

Community subsistence-harvest patterns were described in the *Cook Inlet Planning Area Oil and Gas Lease Sales 191 and 199 Final Environmental Impact Statement* (MMS 2003), which includes the area covered under the proposed NPDES general permit. Information from this EIS is provided in the subsections below (MMS 2003).

7.3.1 Upper Cook Inlet

Tyonek, on the west side of Cook Inlet, traditionally a subsistence harvest area that extends from the Susitna River south to Tuxedni Bay; subsistence harvests concentrate in areas west and south of Tyonek (MMS 2003). Moose and salmon are the most important subsistence resources, although important components of the harvest include nonsalmon fish such as smelt, waterfowl, clams, and a traditionally important beluga whale hunt (ADNR 1999).

The subsistence harvest of salmon is provided through a set gillnet fishery. Because of their early arrival and large size, chinook (king) salmon are an important part of the subsistence harvest. Coho salmon are harvested for subsistence and commercial sale; sockeye, pink, and chum salmon harvests are important primarily for commercial sale. Salmon makes the largest contribution, by weight, to mean household harvest. Chinook salmon are cut into steaks, fillets, and strips for smoking; a variety of traditional products are made from the head, tail, fins, backbone, roe and milt sacks, heart, and stomach. The entire fish is used, and no portion is wasted (ADNR 1999). Salmon fishing begins in the spring, and coho fishing continues into September (MMS 2003).

Dolly Varden and rainbow trout are caught using rod and reel in local fresh water streams throughout the summer (MMS 2003). September begins the harvest season for moose. Moose hunting is done locally off a local network of logging roads and by boat in regional river drainages. A prime location is Trading Bay. Fishing and gathering activities are normally combined with the moose hunt. After salmon, moose make the second-highest contribution by weight to the annual household subsistence harvest.

Waterfowl are hunted at the mouths of Nikolai Creek, Middle River, and McArthur River. Harbor seals are hunted opportunistically along the shorelines of Trading and Redoubt Bays (ADNR 1999).

During the summer, villagers organize hunting trips for beluga whales, which are hunted in stream mouths (MMS 2003). Hunting takes place in upper Cook Inlet from Anchorage to the Beluga River at important locations that include the mouths of the Susitna, Theodore, and Beluga rivers. Most hunting occurs between mid-April and mid-October. In the last several years, the hunt has concentrated at the mouth of the Susitna River and toward Knik. Hunters use open-top dories and harpoons and buoys that minimize the loss of a struck whale. Weather is a major factor in hunting success, and Cook Inlet's shallow waters are notoriously dangerous. Beluga meat is eaten fresh after roasting or boiling and is also preserved by freezing. Beluga blubber is rendered into oil and refrigerated for use in cooking (Stanek 1994; ADNR 1999).

Federal marine mammal regulations have allowed Alaska Natives to continue this hunt although the harvest has been reduced to a single annual strike due to the crash of the Cook Inlet beluga population in 1998 and their now-official status as a depleted species (MMS 2003). A second annual strike has been allocated to the Alaska Native Marine Mammal Hunters' Committee for Anchorage-area subsistence hunters who are not Tyonek residents (O'Harra 2002; NMFS 2002b).

The gathering of wild celery, wild rhubarb, rosehips, and other plants occurs during the summer (MMS 2003). High- and low-bush cranberries, salmonberries, blueberries, and crowberries are harvested in the fall. Winter is a time of relatively low activity in the annual cycle of subsistence life for west Cook Inlet residents. Hunting for ptarmigan, spruce grouse, and hare continues throughout the winter, and a few Tyonek residents trap furbearers from mid-November until the end of winter (ADNR 1999).

7.3.2 Central Kenai Peninsula

The Kenaitze, a group of Dena'ina Athabascans, have made use of Cook Inlet natural resources for generations (MMS 2003). The Kenaitze have dried and smoked fish and picked berries over the years without any direct relationship to size of personal income. A Kenaitze Tribal Fishery was first allowed by the State of Alaska, Dept. of Fish and Game in 1989. Fishing dates vary from year to year, and in 1995, fishing was conducted from May 1 to October 15. Fishing occurs primarily in coastal marine waters south of the mouth of the Kenai River and occasionally immediately upstream of the Warren Ames Bridge in Kenai. The tribal office reported the 1997 harvest at 142 chinook; 2,410 sockeye; 5 pink; and 191 coho salmon (ADNR 1999).

Residents of Ninilchik and members of the Kenaitze Tribe subsist on fish resources—primarily salmon—that occur on the east side of Cook Inlet. Major resources harvested are salmon, halibut, and butter and razor clams. Established in 1993, the Ninilchik Traditional Council Fishery allows for a local subsistence salmon harvest. Fishing time varies, but it is normally held from May 8 to September 30 (MMS 2003). The harvest totals for the 1997 season were 302 chinook, 241 sockeye, 99 coho, and 55 pink salmon (most recent harvest data). Ninilchik residents harvest moose in the fall after the fishing season is over (ADNR 1999).

7.3.3 Lower Kenai Peninsula

Residents of Seldovia, Port Graham, and Nanwalek are the primary subsistence harvesters of the lower Kenai Peninsula, and, since the *Exxon Valdez* oil spill fouled local traditional clamming areas, residents of Nanwalek and Port Graham have used the area around Ninilchik for the harvest of razor clams (MMS 2003). Subsistence harvest of fish, wildlife, and vegetation also occurs at the head and along the southern shore of Kachemak Bay. Area residents harvest seals, sea lions, and sea otters around Yukon Island and Tutka Bay. Primary waterfowl harvest areas are in the vicinity of Seldovia, Tutka, and China. Poot bays and McKeon and Fox River flats. Seabirds and their eggs also are harvested. Along local shorelines, moose, black bear, and mountain goats are hunted. Port Graham and Nanwalek residents harvest salmon in Nanwalek and Koyuktolik (“Dogfish”) bays. Seldovians gather berries in larger quantities than any of the other Kenai Peninsula subsistence communities (ADNR 1999).

Residents of Nanwalek and Port Graham prefer such resources as clams, moose, bear, and especially salmon. These resources provide large quantities of food during a short period of the year and also are preserved for use throughout the remainder of the year. A combination of commercial, subsistence, and rod-and-reel fisheries provide salmon for domestic use. Residents of Nanwalek and Port Graham participate in permitted general subsistence and personal use fisheries that have existed in upper Cook Inlet since 1991. These fisheries also are open to non-Natives. Dipnet fisheries take place on the Kenai and Kasilof rivers and on Fish Creek. A set gillnet fishery takes place on the Kasilof River from June 21 until closed by emergency order or when approximately 5,000–10,000 sockeye salmon have been taken. In addition, a general Kachemak Bay subsistence and personal-use salmon fishery has taken place since before statehood. This fishery uses Fox River drainage salmon runs returning and hatchery stocks returning to the fishing lagoon on Homer Spit and to Fox Creek. In 1993, 326 permits were issued and 1,990 coho, 463 pink, 44 sockeye, 18 chum, and 6 Chinook salmon were harvested (ADNR 1999) (MMS 2003).

Other resources such as trout, cod, halibut, chitons, snails, and crabs generally are used fresh in season. Harbor seals and sea lions are highly valued marine mammals; they are harvested year-round and are extensively shared within the community. A variety of plants also are harvested in Kachemak Bay. Bull kelp, rockweed, and brown seaweeds are collected from intertidal areas, and shoreline areas provide seaside plantain, rye grass, beach pea, wild parsley, and cow parsnip. Seldovia, Kasitsna, and Jakolof bays are important areas for the harvest of marine invertebrates (MMS 2003).

Often overlooked as a means of subsistence, gardening has been part of village life since Russian times (MMS 2003). Potatoes, cabbage, and turnips were brought to the Kenai Peninsula by Russian settlers who planted subsistence gardens out of the need for fresh vegetables (Fall 1981). A variety of local wild berries are picked; particularly low- and high-bush cranberries, rosehips, blueberries, moss berries, and wild raspberries. Locally harvested subsistence foods are distributed widely among community households (ADNR 1999).

7.4 Effects of Wastestream Discharges on Harvest Quantity and Quality

The routine activities associated with exploration, development, and production in the area covered by the proposed NPDES general permit are predicted to have insignificant impacts on the quantity or quality of the commercial, recreational, or subsistence harvests in Cook Inlet, on the basis of the potential effects of disturbance on subsistence resources, the mobility of harvested species, the potential effects of permitted discharges on water quality, and the rapid dilution of discharges by the strong tidal flux of Cook Inlet (MMS 2003).

8.0 COASTAL ZONE MANAGEMENT AND SPECIAL AQUATIC SITES

8.1 COASTAL ZONE MANAGEMENT

8.1.1 Requirements of the Coastal Zone Management Act

The Coastal Zone Management Act requires that states make consistency determinations for any federally licensed or permitted activity affecting the coastal zone of a state with an approved Coastal Zone Management Program (CZMP) (16 USC Section 1456(c)(A) Subpart D). Under the Act, applicants for federal licenses and permits must submit a certification that the proposed activity complies with the state's approved CZMP. The state then has the responsibility to either concur with or object to the consistency determination (SAIC 2001).

Consistency certifications are required to include the following information (15 CFR 930.58):

- A detailed description of the proposed activity and its associated facilities
- A brief assessment relating the probable coastal zone effects of the proposal and its associated facilities to relevant elements of the CZMP
- A brief set of findings indicating that the proposed activity, its associated facilities, and their effects are consistent with relevant provisions of the CZMP
- Any other information required by the state

8.1.2 Relevance of Requirements

Consistency determinations are required if a federally licensed or permitted activity *affects* the coastal zone. Waste stream discharges during extraction, development, and production activities in Cook Inlet will occur in state waters. Therefore, a consistency assessment is required (SAIC 2001).

8.1.3 Status of Coastal Zone Management Planning

In 1978, Alaska adopted the Standards of the Alaska Coastal Management Program (ACMP) at 6 AAC 880 and the Guidelines for District Coastal Management Programs at 6 AAC 85. The ACMP was approved by the U.S. Department of Commerce in 1979. The ACMP has evolved significantly since 1979. Each district coastal management plan, statutory or regulatory revision, or other program amendment that gains state and federal approval is incorporated into the ACMP. The most recent amendment of the ACMP dated June 2, 2005, includes 2 chapters of statutes, 3 chapters of regulations, 33 coastal district plans, and 33 areas meriting special attention and special area management plans (ADNR 2005).

As required under AS 46.40.040, Alaska has adopted regulations at 11 AAC 112 and 11 AAC 114 that provide the coastal districts with the guidance needed to develop their coastal district plans and enforceable policies. Completed District Coastal Management Plans (CMPs) must be approved by Alaska Department of Natural Resources (DNR). The approval of a district CMP is contingent upon development and compliance with the state standards and plan criteria, as generally summarized at AS 46.40.070(a). Once a District CMP has been approved by DNR, that plan becomes an integral part of the ACMP as the enforceable policies of that plan become enforceable as a matter of state law (ADNR 2005).

The proposed project falls under the provisions of the Kenai Peninsula Borough (KPB) CMP (KPB 1990). The KPB CMP includes issues, goals, objectives, and policies directly related to energy and industrial development. These policies are implemented through local review of state and federal permit applications and through borough land use planning and zoning regulations (SAIC 2001).

8.1.4 Relevant Policies

Policies of the ACMP that are potentially relevant to discharges from oil and gas exploration, development, and production facilities are set forth in the ACMP standards (6 AAC Chapter 80). Article 2 sets forth standards related to a number of uses and activities in the Alaska coastal zone. It sets forth the following policy for subsistence uses: "Districts and state agencies shall recognize and assure opportunities for subsistence usage of coastal areas and resources." This policy is designed to be fully implemented in district CMPs.

Article 3 sets forth standards for resources and habitats that are relevant to discharges from oil and gas exploration, development, and production. Of the habitat types it identifies, the following habitats could be affected by these discharges: offshore areas, estuaries, wetlands and tideflats, and exposed high energy coasts. The fundamental standard for management of these habitats is that they "must be managed so as to maintain or enhance the biological, physical, and chemical characteristics of the habitat that contribute to its capacity to support living resources" (6 AAC 80.130[b]).

The Kenai Peninsula Borough CMP was federally approved by the Department of Commerce in June 1990 and includes state coastal waters in Cook Inlet. The Kenai Peninsula Borough CMP incorporates the state policies and adds the following enforceable policies:

- Structures, pipelines and buoys placed in navigable waters shall be visibly marked and placed to minimize navigation hazards or obstruction (KPB CMP Enforceable Policy 2.1).

- To the extent feasible and prudent, all temporary and permanent developments, structures, and facilities in marine and estuarine waters shall be sited, constructed, and operated in a manner that does not create a hazard or obstruction to commercial fishing operations (KPB CMP Enforceable Policy 2.3[a]).

- Within marine and estuarine waters of the coastal area, operators of activities relating to oil, gas, and mining exploration and production, shall provide timely written notification to a list of fishing organizations maintained by the Kenai Peninsula Borough to apprise commercial fishing interests of the schedule and location of development activities prior to initiation of the project. This notice shall include a schedule of activities and a map or description of any potential conflicts or physical obstructions that may impact or preclude commercial fishing opportunities or damage/contaminate fishing gear including but not limited to subsea pipelines, subsea wellhead structures, and modifications to the natural shoreline topography or sea-bottom profile (e.g., causeways, artificial islands, dredge spoil disposal sites) (KPB CMP Enforceable Policy 2.3[b]).

- To the extent feasible and prudent, offshore resource exploration and development activities shall be scheduled and/or located to avoid interference with commercial fishing and subsistence activities (KPB CMP Enforceable Policy 2.3[c]).

- Projects that require dredging or filling in streams, rivers, lakes, wetlands, or saltwater areas including tideflats, will be located, designed, constructed, and maintained in a manner so as to: (a) avoid significant impacts to important fish and wildlife habitat; (b) avoid significant interference with fish migration, spawning, and rearing as well as other important life history phases of wildlife; (c) limit areas of direct disturbance to as small an area as possible; (d) minimize the amount of waterborne sediment traveling away from the dredge or fill site; and (e) maintain circulation and drainage patterns in the area of the fill (KPB CMP Enforceable Policy 2.4).

- Dredged materials disposed onshore will be diked or similarly contained and stabilized in order to prevent erosion or leaching of harmful or toxic substances into wetlands or fishbearing waters (KPB CMP Enforceable Policy 2.5).

- All land and water use activities shall be planned and conducted to mitigate potential adverse impacts on fish and wildlife populations, habitats, and harvest activities. Mitigation shall include the following sequential steps: (a) avoid the loss of natural fish and wildlife populations, habitat, and harvest activities; (b) when the loss cannot be avoided, minimize loss by incorporating measures to reduce the amount or degree of loss; (c) when the loss cannot be avoided or minimized, restore or rehabilitate the resource that was lost or disturbed to its pre-disturbance condition, to the extent feasible and prudent; and (d) when loss or damage is substantial and irreversible and the above objectives cannot be achieved, compensation for the resource and/or harvest loss shall be considered.

In the case of loss of habitat production potential, enhancement of other habitats shall be considered as an alternative means of compensation. In general, compensation with similar habitats in the same locality is preferable to compensation with other types of habitat or habitats located elsewhere. The cost of mitigation relative to the benefits to be gained will be considered in the implementation of the policy (KPB CMP Enforceable Policy 2.6).

- Development in areas with known geological hazards shall be located, designed, constructed and managed to minimize risk to human life and property damage (KPB CMP Enforceable Policy 3.1)

- Development and resource extraction activities shall be sited and conducted to minimize accelerated shoreline erosion or adverse impacts to shoreline processes. Developers shall retain existing vegetative cover in erosion-prone areas to the greatest extent feasible and prudent. In cases where development or other activities lead to removal of vegetation, erosion shall be prevented or, if it occurs, shall be remedied through revegetation or by other appropriate measures (KPB CMP Enforceable Policy 3.3).

- Public access routes to coastal waters and recreational land shall be maintained and to the extent feasible and prudent, increased when public land is leased, disposed, or subdivided (KPB CMP Enforceable Policy 4.4).

- Commercial/industrial operations shall use necessary measures to prevent drilling wastes, oil spills, and other toxic or hazardous materials from contaminating surface and ground water (KPB CMP Enforceable Policy 5.2[a]).

- Any industrial water withdrawal shall comply with the requirements of AS 46.15 and may require that aquifer testing of the production well(s) and monitoring of nearby public or private wells be conducted. Results of testing shall be submitted to the Kenai Peninsula Borough and the Alaska Department of Natural Resources. These results should demonstrate what effects the withdrawal of water necessary to serve the fully developed project will have on prior water rights holders within the area of influence (KPB CMP Enforceable Policy 5.2[b]).

- To the extent feasible and prudent, existing industrial facilities or areas and pipeline routes shall be used to meet new requirements for exploration and production support bases, transmission/shipment (including pipelines and transportation systems), and distribution of energy resources (KPB CMP Enforceable Policy 5.3).

- Projects that require dredging, clearing, or construction in productive habitats shall be designed to keep these activities to the minimum area necessary for the project (KPB CMP Enforceable Policy 5.4).

- Activities associated with oil and gas resource exploration, industrial development, or production shall minimize navigational interference and be located or timed to avoid potential damage to fishing gear. Offshore pipelines and other underwater structures will be located, designed, or protected so as to allow fishing gear to pass over without snagging or otherwise damaging the structure or gear (KPB CMP Enforceable Policy 5.5).

- Pipelines and pipeline right-of-ways shall, to the extent feasible and prudent, be sited, designed, constructed, and maintained to avoid important fishing grounds and to minimize risk to fish and wildlife habitats from a spill, pipeline break, or other construction activities. Pipeline crossings of fishbearing waters and wetlands important to waterfowl and shorebirds shall incorporate mitigative measures, to the extent feasible and prudent, to minimize the amount of oil that may enter such waters as a result of a pipeline rupture or leak (KPB CMP Enforceable Policy 5.6).

- Debris from offshore construction activities shall be removed to an approved onshore disposal site on or before completion of construction (KPB CMP Enforceable Policy 5.7).

- Oil produced in offshore areas shall be transported to shore for storage unless transport is determined to have a greater potential for adverse environmental impact than offshore storage (KPB CMP Enforceable Policy 5.8[a]).

- Oil storage facilities shall be located and bermed in accordance with Policy 13.2 in the Air, Land, and Water Quality section of these policies (KPB CMP Enforceable Policy 5.8[b]).

- Geophysical surveys will, to the extent feasible and prudent, be located, designed, and constructed in a manner so as to avoid disturbances to fish and wildlife populations, habitats, and harvests. Seasonal restrictions, restrictions on the use of explosives, or restrictions relating to the type of transportation used in such operations will be included as necessary to mitigate potential adverse impacts (KPB CMP Enforceable Policy 5.9[a]).

- Geophysical surveys in fresh and marine waters supporting fish or wildlife will require the use of energy sources such as airguns, gas exploders, or other sources that have been demonstrated to be harmless to fish and wildlife and human uses of fish and wildlife. Blasting for purposes other than geophysical surveys will be approved on a case-by-case basis after all steps have been taken to minimize impacts and when no feasible and prudent alternatives exist to meet the public need (KPB CMP Enforceable Policy 5.9[b]).

- Vessels engaged in offshore geophysical exploration will conduct their operations to avoid significant interference with commercial fishing activities (KPB CMP Enforceable Policy 5.9[c]).

- To the extent feasible and prudent, existing pipeline and utility corridors shall be used for new facilities or expansion of existing facilities, rather than developing new corridors (KPB CMP Enforceable Policy 6.4[a]).

- To the extent feasible and prudent, underwater pipelines shall be buried. If pipelines are not buried shall be designed to allow for the passage of fishing gear, or the pipeline route shall be selected to avoid important fishing areas, and anadromous fish migration and feeding areas (KPB CMP Enforceable Policy 6.4[c]).

- All uses and activities in areas traditionally used for subsistence shall accommodate the use of subsistence resources in the planning, development, and operation of these activities (KPB CMP Enforceable Policy 11.1).

- Projects in areas traditionally used for subsistence shall be located, designed, constructed, and operated to minimize adverse impacts to subsistence resources and activities (KPB CMP Enforceable Policy 11.2).

- Land and water use plans for public land and waters surrounding the communities of English Bay, Port Graham, Seldovia, and Tyonek shall avoid or minimize impacts to subsistence resources and activities (KPB CMP Enforceable Policy 11.3).

- Maintenance and enhancement of fish habitat shall be the highest priority use when reviewing proposals for activities which may adversely impact critical spawning, rearing, migration or overwintering areas for fish and shellfish (KPB CMP Enforceable Policy 12.1).

- Appropriation of surface or intergravel waters from streams shall not occur at a withdrawal rate or timing which adversely affects anadromous fish habitat, as determined by the Alaska Department of Fish and Game, unless, under the procedures outlined in AS 46.15, the Commissioner of the Department of Natural Resources makes a finding based on public review that the competing use of water is the best public interest and no feasible and prudent alternative exists (KPB CMP Enforceable Policy 12.2).

- Development activities, facilities and structures shall be designed, sited, constructed and operated in a manner which does not impede or interfere with timely access and movement of fish. Causeways, gravel berms, culverts, and other obstructions or constrictions to fish movement are of particular concern. Existing fish passage problems, including perched culverts, man-made stream obstructions, and velocity barriers shall be corrected by the entity responsible for the problem (KPB CMP Enforceable Policy 12.3).

- Water intake pipes used to remove water from fishbearing waters shall be surrounded by a screened enclosure and velocity shall be limited so as to prevent fish entrainment and impingement (KPB CMP Enforceable Policy 12.5).

- To protect fish, sensitive marine mammals, and other aquatic fauna, explosives shall not be detonated within, beneath, or adjacent to marine, estuarine, or fresh waters that support fish and wildlife during periods when fish or marine mammals are present unless the detonation of the explosives produces an instantaneous pressure rise in the water body of no more than 2.5 pounds per square inch (psi) or unless the water body, including its substrate, is frozen (KPB CMP Enforceable Policy 12.6).

- Seabird colony sites and haulouts and rookeries used by sea lions and harbor seals (as identified in ADFG Regional Guides or with the best available information at the time of project review) shall not be physically altered or disturbed by structures or activities in a manner that would preclude or interfere with continued use of these sites. To the extent feasible and prudent, development structures and facilities with a high level of noise, acoustical or visual disturbance shall maintain a one-half mile buffer from identified use areas for sea lions, harbor seals, and marine birds during periods when these species are present (KPB CMP Enforceable Policy 12.7).

- Uses and activities within or adjacent to coastal waters shall not interfere with migration or feeding of whales. Interference refers to conduct or activities that disrupt an animal’s normal behavior or cause a significant change in the activity of the affected animal (KPB CMP Enforceable Policy 12.8).

- Activities shall avoid harming or disturbing bald eagles or their nest sites in accordance with the Bald Eagle Protection Act (16 USC 668) by timing operations when eagles are not breeding or nesting (generally September 1 to March 1), retaining a buffer of undisturbed natural vegetation around occupied and unoccupied nest trees, or both. The use and size of buffers shall be determined on a case-by-case basis by the U.S. Fish and Wildlife Service and Alaska Department of Fish and Game and may vary with topography, timber type, wind firmness, type of activity, or other factors, but will generally be about 330 feet wide (KPB CMP Enforceable Policy 12.9).

- Hazardous materials, petroleum, or petroleum products as defined in State and federal regulations, shall not be disposed of in the Borough unless done so at a facility designed and approved for this purpose (KPB CMP Enforceable Policy 13.1).

- If previously undiscovered artifacts or areas of historic, prehistoric, or archaeological importance are encountered during development activities, the site shall be protected from further disturbance, and the State Historic Preservation Office shall immediately be notified to evaluate the site or artifacts (KPB CMP Enforceable Policy 14.2).

- The Borough shall pursue the development and adoption of policies and plans relating to the prevention and cleanup of oil spills (KPB CMP Enforceable Policy A6).

8.1.5 Consistency of Waste Discharges with Relevant Coastal Management Programs and Policies

On the basis of the analysis presented in this ODCE, discharges associated with oil and gas exploration, development, and production facilities in the area covered under the proposed NPDES general permit appear to comply with relevant ACMP policies. This assessment is based on the following findings:

- From the analysis in Section 7 of this ODCE, opportunities for subsistence use of coastal resources are unlikely to be threatened by discharges from the facilities covered under the proposed NPDES general permit.

- Coastal habitats will be managed to maintain the biological, physical, and chemical characteristics of the habitats that contribute to their capacity to support living resources. This finding is based on analyses in Sections 5 and 6 of this ODCE indicating that coastal habitats are unlikely to experience significant adverse impacts from discharges of drilling fluid and cuttings.

- Offshore areas will be managed to maintain sport, commercial, and subsistence fisheries. This finding is based on analyses in Section 7 indicating that recreational, commercial, and subsistence harvests are unlikely to experience degradation from waste discharges.

- Estuaries, wetlands, and tideflats will not be adversely affected by toxic waste discharges. This finding is based on analyses in Section 3 indicating that any toxic substances in the discharges will be rapidly diluted and are not likely to be detectable in the vicinity of coastal habitats.

- Mixing and transport processes of high energy coasts will not be affected by discharges of drilling fluid and cuttings regulated under the proposed NPDES general permit.

8.2 SPECIAL AQUATIC SITES

Effects of discharges from the Osprey Platform on biologically important communities are evaluated in Sections 5 and 6.

The following Areas Meriting Special Attention (AMSAs), State Game Refuges (SGRs), State Game Sanctuaries (SGSs), Critical Habitat Areas (CHAs), and National Park are in the area covered by the proposed NPDES general permit:

Palmer Hay Flats SGR	Kachemak Bay CHA
Kalgin Island CHA	Lake Clark National Park
Susitna Flats SGR	Goose Bay SGR
Anchorage Coastal Wildlife Refuge	Clam Gulch CHA
Port Graham/Nanwalek AMSA	McNeil River SGS
Trading Bay SGR	Redoubt Bay CHA
Potter Point SGR	

All facilities covered under the proposed NPDES general permit are prohibited from discharging within the boundaries or within 4,000 meters of a coastal marsh, river mouth, designated AMSA, SGR, SGS, CHA, or National Park. The legal descriptions of these state special areas can be found in Alaska Statute section 16.20. The present boundaries of these state special areas are described in *State of Alaska Game Refuges, Critical Habitat Areas, and Game Sanctuaries,* Alaska Department of Fish and Game, Habitat Division, March 1991.

8.3 SUMMARY

Waste discharges associated with oil and gas exploration, development, and production facilities in the area covered under the proposed NPDES general permit for Cook Inlet are expected to be consistent with relevant ACMP policies. Discharges will be consistent with the objectives of subsistence uses of the coastal zone, management of coastal habitats, and management of specific habitat types (e.g., offshore areas).

9.0 MARINE WATER QUALITY

This section addresses compliance of Cook Inlet oil and gas exploration, development, and production facility discharges with federal technology-based limits, State of Alaska Water Quality Standards (18 AAC 70), and federal Ocean Discharge Criteria.

9.1 TECHNOLOGY-BASED LIMITS

Technology-based limits required under the Effluent Limit Guidelines (ELGs) are contained in the proposed NPDES general permit. The ELGs established BCT, BAT, BPT, and NSPS for the Offshore and Coastal Subcategories of the Oil and Gas Extraction Point Source Category (40 CFR Part 435, Subparts A and D). This section describes the associated limitations and monitoring requirements for the individual wastestreams authorized by the proposed NPDES general permit.

9.1.1 Drilling Fluids

The following limits and prohibitions are based on the ELGs: (1) no discharge of free oil; (2) no discharge of diesel oil; (3) a toxicity limit of 3 percent by volume. The proposed NPDES general permit limits the discharge of organic contaminants through these free oil and diesel oil prohibitions, and by restricting the use of mineral oil in drilling fluids. Permittees must measure free oil in drilling fluid discharges using the static sheen test method. Permittees must measure toxicity using a 96-hour LC_{50} on the suspended particulate phase using the *Mysidopsis bahia* species.

Stock barite, which is added to drilling fluids, contains cadmium and mercury and is the main source of heavy metals in drilling fluid discharges. Pursuant to the ELGs, the proposed NPDES general permit establishes effluent limitations for cadmium and mercury of 3 mg/kg and 1 mg/kg, respectively. The proposed NPDES general permit will require permittees to report cadmium and mercury concentrations measured in the stock barite before it is added to the drilling fluids using USEPA Test Methods 245.5 or 7471. The technology-based limits for cadmium and mercury are surrogate parameters for other metals contained in the barite.

The proposed NPDES general permit prohibits discharges of oil-based drilling fluids, inverse emulsion drilling fluids, oil-contaminated drilling fluids, and drilling fluids to which mineral oil has been added. The purpose of these prohibitions is to ensure compliance with the toxicity limit and the prohibition against the discharge of free oil. The proposed NPDES general permit allows an exception to those prohibitions for drilling fluids to which mineral oil or nonaqueous-based fluids have been added as a carrier agent, lubricity additive, or pill.

The proposed NPDES general permit prohibits discharges of nonaqueous based drilling fluids. In territorial seas and federal waters, however, permittees are authorized to discharge nonaqueous-based drilling fluids that adhere to drill cuttings, pursuant to the

Offshore Category ELGs, as amended in 2001. The limitations that apply to these proposed new drill cuttings discharges are described in Section 9.2.

No drilling is presently underway at the platforms covered by the existing NPDES general permit. Therefore, these platforms do not discharge drilling fluids or drill cuttings. Due to the age of development in Cook Inlet, only a small number of new wells are likely to be drilled at existing platforms in the future. For that reason, EPA does not expect significant discharges of drilling fluids and drill cuttings from existing platforms, as described in the proposed NPDES general permit fact sheet.

9.1.2 Drill Cuttings

The main source of pollutants in drill cutting discharges come from drilling fluids that are used in drilling a well that then adhere to the drill cuttings. Therefore, on the basis of the ELGs for BAT, BCT, BPT, and NSPS, drill cuttings discharges are subject to the same limits that apply to drilling fluid discharges as described in the proposed NPDES general permit fact sheet.

As noted above, in territorial seas and federal waters, the proposed NPDES general permit would authorize the discharge of drill cuttings generated using synthetic-based drilling fluids. The use of synthetic-based fluids is a type of pollution prevention technology because the drilling fluids are not disposed of through bulk discharge at the end of drilling. Instead, the drilling fluids are brought back to shore and refurbished so they can be reused. In addition, drilling with synthetic-based fluids allows operators to drill a slimmer well and causes less erosion of the well during drilling than when water-based fluids are used, reducing the volume of drill cuttings that are discharged. The proposed NPDES general permit requires permittees to remove synthetic-based drilling fluids from the drill cuttings prior to discharge, which is not required when water-based fluids are used.

The ELGs also include limits for sediment toxicity and biodegradation. Although the ELGs do not address specific types of synthetic-based fluids, the ELGs contain toxicity and biodegradation limits that require operators to use less toxic fluids that biodegrade quickly.

The proposed NPDES general permit contains limits for synthetic-based fluids at three points. First, for stock synthetic fluids prior to combination with other components of the drilling fluids system, the proposed NPDES general permit imposes limits on polynuclear aromatic hydrocarbons (PAHs), sediment toxicity (10-day), and biodegradation rate. Second, combined fluid components are limited for formation oil contamination, measured using gas chromatography/mass spectrometry (GC/MS). Third, drilling fluids that adhere to drill cuttings are limited for sediment toxicity (4-day), and formation oil contamination as measured by either a reverse phase extraction test or GC/MS.

9.1.3 Produced Water

The ELGs require oil and grease limits of 29 mg/L, monthly average, and 42 mg/L, daily maximum, for produced water. These limitations are retained in the proposed NPDES general permit. In formulating those ELGs, EPA examined all the pollutants that could be expected to be discharged in produced water and concluded that they could be appropriately controlled by the oil and grease limits. Therefore, the proposed NPDES general permit may not impose more stringent BPJ-based effluent limits, such as an outright prohibition on the discharge of produced water, to control those same pollutants.

To promote better compliance with the oil and grease limit, the proposed NPDES general permit includes a new produced water sheen monitoring requirement. Under this requirement, when conditions allow, operators would observe the receiving water down current of the produced water discharge once per day. If sheen is observed, operators would collect and analyze a produced water sample to determine compliance with the oil and grease limit. Observations must be made during slack tide so that turbulence that is generally present during periods of high ambient velocity does not interfere with the ability to observe sheen.

9.1.4 Produced Sand

The proposed NPDES general permit retains the existing NPDES general permit's prohibition of the discharge of produced sand accord to the ELGs.

9.1.5 Well Treatment, Completion, and Workover Fluids

For well treatment, completion, and workover fluid discharges, the ELGs for NSPS and BAT require oil and grease limits of 29 mg/L, monthly average, and 42 mg/L, daily maximum. In addition, the BCT ELGs require a limit of no free oil. These limits were contained in the existing NPDES general permit and are retained in the proposed NPDES general permit.

9.1.6 Deck Drainage

For deck drainage discharges, the Offshore and Coastal Subcategory ELGs for NSPS, BAT, and BCT require a limitation of no discharge of free oil as determined by the presence of film, sheen, or a discoloration of the surface of the receiving water. This limit was contained in the existing NPDES general permit and has been retained in the proposed NPDES general permit.

9.1.7 Sanitary Wastewater

For sanitary waste discharges, the Offshore and Coastal Subcategory ELGs for NSPS and BCT require total residual chlorine to be maintained as close to 1 mg/L as possible for facilities that are continuously manned by 10 or more persons. The ELGs also require no discharge of floating solids for offshore facilities that are continuously manned by nine or fewer persons or intermittently manned by any number of persons. These limits were contained in the existing NPDES general permit and are retained in the proposed NPDES general permit.

9.1.8 Domestic Wastewater

For domestic waste discharges, the ELGs prohibit the discharge of floating solids, garbage, or foam and require compliance with 33 CFR Part 151. This limit was contained in the existing NPDES general permit and has been retained in the proposed NPDES general permit.

9.1.9 Miscellaneous Discharges

The existing NPDES general permit authorized miscellaneous discharges from desalination wastewater (005); blowout preventer fluid (006); boiler blowdown (007); fire control system test water (008); noncontact cooling water (009); uncontaminated ballast water (010); bilge water (011); excess cement slurry (012); muds, cuttings, and cement at the sea floor (013); and waterflood wastewater (014). The existing NPDES general permit limited those discharges to no free oil as monitored by the visual sheen test method. The existing NPDES general permit required discharges of uncontaminated ballast water and bilge water to be treated in an oil-water separator. The existing NPDES general permit also required operators to sample bilge water discharges for free oil using the static sheen test method when discharges occurred during broken, unstable, or stable ice conditions. In addition, the existing NPDES general permit required operators to maintain a precise inventory of the type and quantity of chemicals added to waterflooding, noncontact cooling water, and desalinization wastewater discharges. The ELGs do not address these miscellaneous discharges. To satisfy antibacksliding requirements, the proposed NPDES general permit retains these limitations and monitoring requirements, except, as described in Section 9.2, when treatment chemicals such as corrosion inhibitors or biocides are added.

9.1.10 Chemically-Treated Sea Water and Fresh Water Discharges

The proposed NPDES general permit uses generic BPJ-based limits, on the basis of available technology, to regulate chemically treated sea water and fresh water discharges, rather than attempting to limit the discharge of specific biocides, scale inhibitors, and corrosion inhibitors. Due to the large number of chemical additives used, it would be very difficult to develop technology-based limits for each individual additive. In addition, if the proposed NPDES general permit were to limit specific chemicals, it could potentially halt the development and use of new and potentially more beneficial treatment chemicals.

Many of the chemicals normally added to sea water or fresh water, especially biocides, have manufacturer's recommended maximum concentrations or EPA product registration labeling. In addition, information obtained from offshore operators demonstrates that it is unnecessary to use any of the chemical additives or biocides in concentrations greater than 500 mg/L as described in the proposed NPDES general permit fact sheet. Therefore, the proposed NPDES general permit limits discharges of sea water or fresh water to the most stringent of the following:

- The maximum concentrations and any other conditions specified in the EPA product registration labeling if the chemical additive is an EPA-registered product.
- The maximum manufacturer's recommended concentration
- 500 mg/L

Compliance with this limit is calculated on the basis of the amount of treatment chemicals added to the volume of water discharged.

As with other miscellaneous discharges described above, the proposed NPDES general permit contains BCT limits prohibiting the discharge of free oil for chemically treated sea water and fresh water discharges. Free oil is a direct measurement of oil contamination and, on the basis of BPJ, the proposed NPDES general permit uses it as a surrogate parameter for conventional pollutants in these discharges.

9.1.11 Stormwater Runoff from Onshore Facilities

In an effort to regulate discharges from onshore production facilities similar to the manner in which such discharges are regulated for shore-based industrial facilities, EPA proposes to include new requirements in the proposed NPDES general permit. These requirements have been imposed pursuant to CWA section 402(1)(2) and 40 CFR section 122.26(c). Specifically, operators of onshore facilities are required to develop and implement stormwater pollution prevention plans (SWPPPs). The SWPPPs must include best management practices (BMPs) to monitor and maintain operations to prevent contamination of stormwater. If facilities are covered under a separate NPDES permit and have completed these requirements in compliance with that permit, these requirements would not apply.

9.1.12 All Discharges

The proposed NPDES general permit prohibits the discharge of rubbish, trash, and other refuse on the basis of the International Convention for the Prevention of Pollution from Ships (MARPOL). The proposed NPDES general permit also prohibits the discharge of sandblasting waste pursuant to 33 CFR Part 151. Operators typically use management practices such as enclosing areas being sandblasted in tarps to capture as much of the waste as practicable. The proposed NPDES general permit clarifies that the use of reasonable measures such as enclosing the area in tarps would meet the intent of the discharge prohibition.

On the basis of CWA Section 403(c), 33 USC section 1343(c), the proposed NPDES general permit also requires minimization of the discharge of surfactants, dispersants, and detergents.

9.2 WATER QUALITY-BASED PERMIT CONDITIONS

The proposed NPDES general permit establishes water quality-based limitations and monitoring requirements necessary to ensure that the authorized discharges comply with the CWA's Ocean Discharge Criteria and State Water Quality Standards, for those waters in which they apply (see Section 1.2.3 of this ODCE).

9.2.1 Ocean Discharge Criteria

Section 403 of the Act, 33 USC section 1343, requires NPDES permits for discharges into offshore waters, including territorial seas and federal waters (Southern Cook Inlet in the case of the proposed NPDES general permit), to comply with the Ocean Discharge Criteria for determining the potential degradation of the marine environment. See 40 CFR Part 125, Subpart M. The Ocean Discharge Criteria are intended to "prevent unreasonable degradation of the marine environment and to authorize imposition of effluent limitations, including a prohibition of discharge, if necessary, to ensure this goal." (49 FR 65942, October 3, 1980, as cited in the proposed NPDES general permit fact sheet).

Under the Ocean Discharge Criteria, EPA may issue an NPDES permit if it determines that a discharge will not cause unreasonable degradation to the marine environment. If insufficient information exists to make such a determination prior to permit issuance, EPA may only issue the permit if the discharge will not cause irreparable harm to the marine environment while additional monitoring is undertaken, and if there are no reasonable alternatives to onsite disposal.

The MMS completed a Preliminary Ocean Discharge Criteria Evaluation (ODCE) for Lease Sale No. 60 and a revised Preliminary ODCE for Lease Sale No. 88 and state lease sales in Cook Inlet for discharges from facilities in those lease sale areas. For the existing NPDES general permit, EPA updated the existing ODCE information in the ODCE for *Cook Inlet (Oil & Gas Lease Sale 149) and Shelikof Strait* (Tetra Tech 1994). EPA has further updated that evaluation for the proposed NPDES general permit and expanded its scope to include the areas covered under MMS Lease Sale Nos. 191 and 199 as well as adjoining territorial seas as described in the proposed NPDES general permit fact sheet.

On the basis of the Ocean Discharge Criteria, the existing NPDES general permit established discharge rate and depth limits for drilling fluids discharges as well as discharge prohibitions in several environmentally sensitive areas of Cook Inlet. The proposed NPDES general permit retains these requirements and includes new requirements based on Ocean Discharge Criteria, including toxicity limits for produced water and toxicity limits for sea water and fresh water discharges to which treatment chemicals have been added. EPA has determined that discharges authorized from the proposed NPDES general permit will not cause unreasonable degradation as long as the proposed NPDES general permit's limitations, depth-related conditions, and environmental monitoring requirements are met.

9.2.2 State Water Quality Standards

Section 301(b)(1)(C) of the Act, 33 USC section 1311(b)(1)(C), and 40 CFR section 122.44(d)(1) require NDPES permits to contain the limitations and conditions that are necessary to attain State Water Quality Standards. The existing NPDES general permit contained limits based on state water quality standards for metals, hydrocarbons, and toxicity in produced water discharges. The proposed NPDES general permit contains revised water quality-based effluent limits based on updated mixing zone computations. Proposed mixing zones are provided in Table 3 of the proposed NPDES general permit fact sheet.

In addition, treatment chemicals such as biocides, corrosion inhibitors, and oxygen scavengers are used in a number of discharges such as cooling water and waterflood wastewater. Many of those chemical additives are highly toxic, which was an issue raised by tribal members during the Traditional Ecological Knowledge interview process described the proposed NPDES general permit fact sheet. To ensure that these discharges comply with both State Water Quality Standards and Ocean Discharge Criteria, the proposed NPDES general permit includes whole effluent toxicity limitations.

Alaska marine water quality standards for the protection of aquatic life (18 AAC 70) (ADEC 2003) include the following:

Temperature: Discharges may not cause the weekly average temperature to increase more than 1ºC. The maximum rate of change may not exceed 0.5ºC per hour. Normal daily temperature cycles may not be altered in amplitude or frequency.

Dissolved Inorganic Substances: Discharges may not increase the natural salinity by more than 4 parts per thousand (ppt) for waters with natural salinity between 13.5 and 35.0 ppt (as in the Forelands area of Cook Inlet).

Sediment: Discharges may not cause a measureable increase in concentration of settleable solids above natural conditions, as measured by the volumetric Imhoff cone method.

Toxics and Other Deleterious Organic and Inorganic Substances: Individual substances in the discharges may not exceed the criteria in Table IV and Table V, column B in the *Alaska Water Quality Criteria for Toxic and Other Deleterious Organic and Inorganic Substances*, May 2003, or any chronic or acute criteria established in 18 AAC 70, for a toxic pollutant of concern, to protect sensitive and biologically important life stages of resident species of Alaska. There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, toxic effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized in 18 AAC 70. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms, as determined by either bioassay or organoleptic tests.

Color: Color or apparent color may not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life. For all waters without a seasonally established nor for aquatic life, color or apparent color may not exceed 50 color units or the natural condition, whichever is greater.

Petroleum Hydrocarbons, Oil and Grease: Total aqueous hydrocarbons in the water column may not exceed 15 µg/L. Total aromatic hydrocarbons in the water column may not exceed 10 µg /L. There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.

Radioactivity: The discharges may not exceed the concentration specified in the Alaska Drinking Water Standards (18 AAC 80).

Residues: The discharges may not, alone, or in combination with other substances or wastes, make the water unfit or unsafe for use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. The discharges may not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.

9.3 MIXING ZONES

Mixing zones are established by states and EPA to specify a limited portion of a waterbody in which otherwise applicable water quality criteria may be exceeded. In the coastal waters and territorial seas, states have the authority to define mixing zones and determine their sizes. In territorial seas, the Ocean Discharge Criteria concurrently apply and can restrict mixing zone sizes. In federal waters, state standards do not apply; thus, mixing zones are governed solely by the Ocean Discharge Criteria as described in the proposed NPDES general permit fact sheet.

The mixing zone sizes have been recalculated for the proposed NPDES general permit. In addition, the proposed NPDES general permit established water quality-based effluent limits for chemically treated sea water on the basis of a calculated mixing zone.

9.3.1 Mixing Zones and State Water Quality Standards

When authorized by ADEC, the State Water Quality Standards require mixing zones to be as small as practicable (18 Alaska Administrative Code 70.240). In determining whether to use a mixing zone, 18 AAC 70.245 requires full protection of the existing uses of the waterbody. Within a mixing zone, State Water Quality Standards allow water quality criteria for chronic aquatic life and human health protection to be exceeded as long as water quality criteria are met outside the mixing zone. Some water quality standards, however, require that acute aquatic life criteria are met at a boundary of a smaller zone of initial dilution established within the mixing zone (18 AAC 70.255). ADEC has determined that the discharges authorized by the existing NPDES general permit are not likely to persist in the environment and, therefore, has authorized mixing zones as described in the proposed NPDES general permit fact sheet.

9.3.2 Mixing Zones and Ocean Discharge Criteria

The Ocean Discharge Criteria define mixing zones to be that portion of the waterbody that extends laterally a distance of 100 meters from the discharge point (40 CFR section 125.121(c). Ocean Discharge Criteria provide EPA with the option of establishing smaller mixing zones that are based on a zone of initial dilution calculated using a plume model. The proposed NPDES general permit implements generic 100 meter mixing zones throughout the Cook Inlet for chemically treated sea water discharges in accordance with the Ocean Discharge Criteria.

9.3.3 Mixing Zone Calculations for Produced Water

For most discharges, ADEC determines the size of a mixing zone on a case-by-case basis as a part of the CWA Section 401 certification process. Typically, dischargers submit applications that request a specific mixing zone size. The flow volume is a critical input in the mixing zone calculation as described in the proposed NPDES general permit fact sheet.

Since the existing NPDES general permit was issued, there have been several significant changes in both the volume and number of produced water discharges in Cook Inlet. Platforms Dillon and Baker no longer discharge produced water. The produced water volume discharged from the Trading Bay facility has increased significantly since the existing NPDES general permit was issued because of maturing production in the producing fields.

On the basis of present discharge rates and pollutant concentrations reported by the operators, EPA expects ADEC to approve new mixing zones. Water quality-based limits were calculated in the proposed NPDES general permit on the basis of the mixing zones that EPA anticipates will be authorized by ADEC. The lengths of the new mixing zones and the previous mixing zone lengths are shown in Table 3 of the proposed NPDES general permit fact sheet.

EPA and ADEC have concluded that it is practicable to reduce the size of the mixing zone at the Trading Bay facility through the installation of a diffuser. This discharge is in fairly shallow water and is much closer to sensitive areas than any other produced water discharge in Cook Inlet as described in the proposed NPDES general permit fact sheet.

9.3.3.1 Water Quality Criteria Comparison

EPA compared effluent data to the State Water Quality Criteria for produced water discharges (see Appendix A of the proposed NPDES general permit fact sheet). The

Appendix does not show parameters that EPA does not expect to be present in produced water discharges, or for which no water quality criteria exist. The effluent concentration of the produced water discharges is generally greater than water quality criteria for ammonia, arsenic, copper, manganese, mercury, zinc, total aromatic hydrocarbons, and total aqueous hydrocarbons. However, according to EPA modeling, only ammonia, copper, total aromatic hydrocarbons, and total aqueous hydrocarbons have the potential to exceed water quality criteria in mixing zones.

9.3.3.2 Proposed Water Quality-Based Limitations

The proposed NPDES general permit contains water quality-based limits for total aromatic hydrocarbons, total aqueous hydrocarbons, ammonia, copper, manganese, mercury, nickel, and zinc. EPA has not retained the water quality-based limits for arsenic, cadmium, lead, and silver in the proposed NPDES general permit because new information in recent discharge monitoring reports indicates that there is no reasonable potential for exceedance of the water quality criteria for these parameters. Whole effluent toxicity limits for produced water were included in the existing NPDES general permit, and retained in the proposed NPDES general permit (Appendix B).

9.4 CHEMICALLY TREATED SEA WATER DISCHARGES

The proposed NPDES general permit includes new water quality-based limits for miscellaneous discharges to which treatment chemicals, such as biocides, are added. Whole effluent toxicity limits in the proposed NPDES general permit are based on the effluent concentration at the edge of the mixing zone. The proposed NPDES general permit contains whole effluent toxicity and free oil limits because they are necessary to meet state water quality standards and Ocean Discharge Criteria.

Operators will be able to use treatment chemicals that are most efficient for their operations as long as they enable the facility to consistently meet effluent limits. While this approach will ensure the protection for water quality, it will also provide maximum flexibility for operators to switch to newer products that may become available. Therefore, to ensure flexibility, the proposed NPDES general permit does not prescribe specific chemical additives that may be used.

9.4.1 Toxicity Limitations

As calculated, the toxicity limits will prevent the discharge of pollutants in concentrations that will result in chronic toxicity at the edge of a 100-meter mixing zone. Toxicity limits will ensure compliance with State Water Quality Standards (18 AAC 70.030), which states that "[a]n effluent discharges to a water may not impart chronic toxicity to aquatic organisms."

EPA calculated critical dilutions at which the toxicity limits must be met using CORMIX. Because discharges less than 10,000 gallons per day will be very dilute and are not likely to exhibit toxic effects at the edge of the mixing zone, toxicity limits are not proposed for these discharges. The proposed NPDES general permit includes a table so that operators can obtain their toxicity effluent limits according to their discharge rate.

9.4.2 Free Oil Limitations

The proposed NPDES general permit limits the discharge of free oil to help prevent the discharge of toxic pollutants contained in oil. The Ocean Discharge Criteria include 10 factors that must be considered in determining whether a discharge will cause unreasonable degradation of the marine environment (40 CFR section 125.122). One of the 10 factors is the potential impact on human health through direct and indirect pathways. 40 CFR section 110.3 defines quantities of oil that may be harmful to public health or welfare as a discharge that causes a sheen or discoloration on the receiving water. Therefore, the proposed NPDES general permit limits chemically treated sea water discharges to no free oil as measured using the visual sheen test method.

9.4.3 Sanitary Waste Discharges

The proposed NPDES general permit includes the same water-quality based limitations for BOD and TSS as the existing NPDES general permit for facilities in coastal waters and the territorial seas.

As required by CWA Section 312, 33 USC section 1322, the existing NPDES general permit limits the total residual chlorine concentration to a minimum of 1 mg/L throughout the area of coverage. The existing NPDES general permit also has a daily maximum limitation for total residual chlorine of 19 mg/L, which applies to facilities in coastal waters and the territorial seas. The proposed NPDES general permit requires effluent concentrations at the edge of the mixing zone to meet a more stringent limit 7 mg/L to meet the State Water Quality Standard of 7 μg/L with an effluent dilution of 0.1 percent. EPA expects that most permittees will install dechlorination equipment to meet this new effluent limit as described in the proposed NPDES general permit fact sheet.

9.5 SUMMARY

Discharges to state waters from exploration, development, and production facilities will include drilling fluids and drill cuttings; deck drainage; sanitary wastes; domestic wastes; desalination unit wastes; blowout preventer fluid; boiler blowdown; fire control system test water; noncontact cooling water; uncontaminated ballast water; bilge water; excess cement slurry; mud, cuttings, cement at seafloor; waterflooding discharges; produced water and produced sand; completion fluids; workover fluids; well treatment fluids; test fluids; and stormwater runoff from onshore facilities.

The volume and concentrations of pollutants in the discharges from oil and gas facilities in Cook Inlet covered under the proposed NPDES general permit are expected to meet human health water quality criteria at the end-of-pipe, as well as water quality criteria for the protection of aquatic life. Therefore, there is little potential for discharges to exceed marine water quality criteria.

10.0 DETERMINATION OF UNREASONABLE DEGRADATION

Chapter 1.0 of this ODCE provides the regulatory definition of unreasonable degradation of the marine environment (40 CFR 125.121[e]) and indicates the 10 criteria that are to be considered when making this determination (40 CFR 125.122). The actual determination of whether the discharge will cause unreasonable degradation is made by EPA Region 10's Administrator. The intent of this chapter is to briefly summarize information pertinent to the determination of unreasonable degradation.

10.1 CRITERION 1

The quantities, composition, and potential for bioaccumulation or persistence of the pollutants to be discharged:

- Approximately 3,690 tons of drilling fluids, 5,590 tons of drill cuttings, and 7.36 million cubic meters of produced waters would be produced from oil and gas exploration, development, and production activities in Cook Inlet each year; however, discharge of drilling fluids and drill cuttings is authorized only at exploratory facilities and existing facilities, and the discharge of produced water is not authorized from new sources and new exploratory facilities.

- Produced waters discharged from Trading Bay will be discharging a large amount of produced water in comparison to other existing platforms, but it will be required to install a diffuser to reduce pollutant concentrations in its produced water discharge.

- Due to the minimal pollutant concentrations and/or low volume of the remaining discharges, the potential for bioaccumulation or persistence of contaminants is low.

- Discharges from exploration, development, and production activities are expected to meet the appropriate effluent limitation requirements listed in the proposed NPDES general permit as well as the appropriate Alaska Water Quality Standards in 18 AAC 70.

- Operators of onshore facilities are required to develop and implement stormwater pollution prevention plans (SWPPPs), which must include best management practices (BMPs) to monitor and maintain operations to prevent contamination of stormwater.

10.2 CRITERION 2

The potential transport of such pollutants by biological, physical, or chemical processes:

- Cook Inlet is a high-energy environment. Fast tidal currents and tremendous mixing produce rapid dispersion of soluble and particulate pollutants.

- Within a distance of between 100 and 200 meters from the discharge point, the turbidity caused by suspended particulate matter in discharged fluids and cuttings is expected to be diluted to levels that are within the range associated with the variability of naturally occurring suspended particulate matter concentrations.

- In general, the amounts of additives in the other discharges are expected to be relatively small (from 4 to 400 or 800 liters per month) and diluted with sea water several hundred to several thousand times before being discharged into the receiving waters.

- The nonvolatile hydrocarbons (oil and grease) in produced waters from an existing oil production platform would be diluted a thousandfold within several hundred meters. At a 1,000:1 dilution, the concentrations of nonvolatile hydrocarbons would reduce from 29 parts per million to 29 parts per billion within several hundred meters of the platform, and the concentrations of total aromatic hydrocarbons might range from 8–13 parts per million close to the platform and 8–13 parts per billion within several hundred meters of the platform.

10.3 CRITERION 3

The composition and vulnerability of the biological communities that may be exposed to such pollutants, including the presence of unique species or communities of species, the presence of species identified as endangered or threatened pursuant to the Endangered Species Act, or the presence of those species critical to the structure or function of the ecosystem, such as those important for the food chain:

- Low concentrations of BOD and nutrients in sanitary waste discharges could stimulate primary productivity and enhance zooplankton production. This effect is predicted to be negligible.

- Threatened and endangered species that could occur in Cook Inlet include chinook salmon, sockeye salmon, short-tailed albatross, Steller's eider, blue whale, fin whale, humpback whale, northern Pacific right whale, Sei whale, sperm whale, Steller sea lion, and northern sea otter. Most of these species are not likely to use water close to permitted activities or are unlikely to inhabit Cook Inlet waters; they are unlikely to be affected by discharges from oil and gas exploration, production, and development facilities in Cook Inlet.

- The Steller sea lion has designated critical habitat within the geographic area of coverage for the proposed NPDES general permit but critical habitat restrictions do not allow discharges in the vicinity of Steller sea lions. In addition, rapid dilution and low toxicity of drilling fluids discharged to Cook Inlet imply that these discharges would not be likely to adversely affect pollock or other Steller sea lion prey. Pollutant concentrations in mixing zones complying with chronic water standards are not expected to adversely affect Steller sea lions in Cook Inlet.

- Drilling fluid discharges in Cook Inlet could alter prey available to the northern sea otter in the immediate vicinity of the discharges through burial of benthic organisms or changing bottom habitat characteristics. Exposure to pollutants within mixing zones and exposure to discharged water complying with chronic water standards is not expected to adversely affect northern sea otters.

- Beluga whales have been identified as depleted under the Marine Mammal Protection Act. Drilling fluid discharges in Cook Inlet could adversely affect prey availability in the immediate vicinity of the discharges because of the burial of benthic organisms, or changes in bottom habitat characteristics, but such effects would be of limited size and duration. The discharges authorized under the proposed NPDES general permit may affect individual beluga whales either directly or indirectly; however, they are not likely to contribute to a further decline of the Cook Inlet beluga whale stock or affect the recovery of the population as a whole.

10.4 CRITERION 4

The importance of the receiving water area to the surrounding biological community, including the presence of spawning sites, nursery/forage areas, migratory pathways, or areas necessary for other functions or critical stages in the life cycle of an organism:

- Anadromous fish migrate through Cook Inlet towards spawning habitat in rivers and streams, and juveniles travel through Cook Inlet toward marine feeding areas. Habitats of potential concern (HPCs) within essential fish habitat (EFH) in Cook Inlet are the estuarine and nearshore habitats of Pacific salmon (e.g., eelgrass [*Zostera sp.*] beds) and herring spawning grounds (e.g., rockweed [*Fucus sp.*] and eelgrass). Offshore HPCs include areas with substrates that serve as cover for organisms including groundfish. All anadromous streams qualify as HPC. The Susitna River drainage is a primary source of these anadromous fish in Cook Inlet. Eulachon also return to spawn in some of the rivers. Because the waste discharges will either be injected or will be rapidly dispersed, it is unlikely that they would adversely affect migrating anadromous fish.

- Cook Inlet is an important area for marine mammals including beluga whales, Steller sea lions, and harbor seals. No adverse impacts from the waste discharges from the oil and gas exploration, development, and production facilities in Cook Inlet are predicted.

- Lower Cook Inlet is one of the most productive areas for seabirds in Alaska, with an estimated 100,000 seabirds; 18 species breed in Cook Inlet.

- Waterbirds and waterfowl breed in the Cook Inlet region. In spring, large numbers of waterbirds migrate through the area. Large populations of staging waterfowl are found in tidal flats, along river mouths, and in bays on the west side of the inlet, including Redoubt Bay. Redoubt Bay has especially high concentrations of geese and ducks.

- Due to the injection of waste streams or rapid dispersion of waste discharges from the oil and gas exploration, development, and production facilities in Cook Inlet, no adverse impacts on birds are predicted.

10.5 CRITERION 5

The existence of special aquatic sites including, but not limited to, marine sanctuaries and refuges, parks, national and historic monuments, national seashores, wilderness areas, and coral reefs:

The following SGRs, SGSs, CHAs, National Park, and AMSAs are in the proposed NPDES general permit coverage area:

Palmer Hay Flats SGR	Kachemak Bay CHA
Kalgin Island CHA	Lake Clark National Park
Susitna Flats SGR	Goose Bay SGR
Anchorage Coastal Wildlife Refuge	Clam Gulch CHA
Port Graham/Nanwalek AMSA	McNeil River SGS
Trading Bay SGR	Redoubt Bay CHA
Potter Point SGR	

The facilities covered under the proposed NPDES general permit are not within and these facilities are prohibited from discharging to any of these areas, SGRs, SGSs, CHAs, National Park, or AMSAs. Due to the relative low toxicity of waste discharges from platforms in Cook Inlet and the rapid dispersion of pollutants in these waste discharges, no adverse effects are predicted.

10.6 CRITERION 6

The potential impacts on human health through direct and indirect pathways:

- There is no known direct exposure pathway to humans from the discharges associated with oil and gas exploration in Alaska; indirect exposure is primarily from direct consumption of species exposed to discharges.

- Increases in metal body burdens of animals consumed by humans that are attributable to drilling fluid discharges are expected to be minor, but metal content of drilling fluids and other discharges from oil and gas exploration, development, and production facilities should be minimized through adherence to the effluent limitations in the proposed NPDES general permit to decrease the amount of heavy metals discharged to Cook Inlet.

- Most contaminants detected in Cook Inlet fish are less than or comparable to contaminants detected in regional or national studies.

- Permitted discharges from the existing and new oil and gas platforms in Cook Inlet are minimally toxic; therefore, adverse human health effects are unlikely to result from Cook Inlet exploration, development, and production discharges.

10.7 CRITERION 7

Existing or potential recreational and commercial fishing, including finfishing and shellfishing:

The routine activities associated with exploration, development, and production in the area covered by the proposed NPDES general permit are predicted to have insignificant impacts on the quantity or quality of the commercial, recreational, or subsistence harvests in Cook Inlet on the basis of the potential effects of disturbance on subsistence resources, the mobility of harvested species, the potential effects of permitted discharges on water quality, and the rapid dilution of discharges by the strong tidal flux of Cook Inlet.

10.8 CRITERION 8

Any applicable requirements of an approved Coastal Zone Management Plan:

Waste discharges associated with oil and gas exploration, development, and production facilities in Cook Inlet are expected to be consistent with relevant

Alaska Coastal Management Program policies and with the Kenai Peninsula Borough Coastal Management Program.

10.9 CRITERION 9

Such other factors relating to the effects of the discharge as may be appropriate:

No other factors have been identified relating to the effects of the discharge.

10.10 CRITERION 10

Marine water quality criteria developed pursuant to Section 304(a)(I):

- To promote better compliance with the oil and grease limit, the proposed NPDES general permit includes a new produced water oil and grease static sheen monitoring requirement.

- The discharges from oil and gas exploration, development, and production facilities in Cook Inlet are expected to comply with all marine water quality criteria.

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